MEDICAL IMPAIRMENT STUDY

1929

THE ACTUARIAL SOCIETY OF AMERICA
AND
THE ASSOCIATION OF LIFE INSURANCE MEDICAL DIRECTORS

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1929

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M. A. M. I.—Medico-Actuarial Mortality Investigation (1912-1914).

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J. I. A. —Journal of Institute of Actuaries, London, England.

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NOTE:—Sections dealing with Mortality by Build, Family History of or Association with Tuberculosis, and Large Amounts Insured are to be published separately.

ERRATA

Page	Code No.	
4	....	In the second formula instead of "u_{x+h}" read "u_{x+2h}"
23	(142) (a)	Instead of an average company rating of "185%" read "160%"
23	(142) (b)	Instead of an average company rating of "150%" read "125%"

INTRODUCTION

IN OCTOBER 1928 the Actuarial Society of America and the Association of Life Insurance Medical Directors at their meetings instructed their Joint Committee on Mortality to prepare plans for new investigations into the effect on mortality of medical impairments. After several meetings of the Committee the medical impairments to be investigated were selected, plans were formulated and a letter of instructions for preparing the material was sent to the companies on December 26, 1928. A copy of that letter is given in the appendix. The Medico-Actuarial Mortality Investigation, herein called the M. A. M. I., was prepared by this Committee and the results published in five volumes during the years 1912 to 1914. The data covered the issues of 1885 to 1908 inclusive and accordingly it seemed desirable in the present investigation to take the material for the issues of 1909 to 1927 inclusive, carried to the anniversaries in 1928. In 1925 the new medical code was put into effect, but the majority of the companies retained the old code for the insurance issued prior to that time. It was not feasible to conduct the investigation under several codes and the companies accordingly agreed to re-perforate their mortality cards according to the new code for issues of 1924 and prior. The natural desire was to save the companies both time and expense in re-perforating their cards, but this would not have resulted in an investigation conducted according to the most modern classifications. With the increase in medical knowledge came a better differentiation under a number of impairments, while in the case of heart murmurs there was a complete change from coding them according to the diagnosis of the physician to recording his findings in the examination of the heart. The Committee wish to express their hearty thanks to the companies which were willing to re-code their cards in the interests of uniformity, especially as in many cases it meant referring to the original medical examinations in order to obtain the necessary information.

In the medical code of 1925 which was prepared by this Committee the letter R (Required) was placed after certain codes in order to indicate the opinion of the Committee that the subject thus marked should be investigated at a later time. In view of the small amount of material which was available a few such impairments were omitted, and in view of the increasing importance of certain impairments, several were added. In determining the classes in which there would probably be sufficient material, two large companies listed their new business for an entire year and also the deaths for a number of years of experience.

It was desired to conduct an investigation into (a) the mortality among policyholders insured for large amounts, (b) the mortality in the Southern States, (c) cases with a record of medical impairment which was apparently transitory and (d) applicants with two or more deaths in the family from apoplexy, insanity or diabetes. A number of companies stated to the members of the Committee that there would be very great difficulty in obtaining information on these lines as they had not made complete preparation for such an investigation. As it was felt that such investigations should be made, it was decided to ask every company represented on the Committee to make one or more of these investigations, but it was announced that data from any company would be welcomed.

As practically all the companies likely to participate in the investigation had mortality investigation divisions with an up-to-date equipment of perforating machines, and as it was not feasible to prepare perforated cards from policy sheets at the Central Bureau without a great deal of delay, the companies were asked to submit their data on summary sheets for each class unless there were less than fifty entrants, in which case perforated cards were to be prepared for the Central Bureau. A copy of the summary sheet is given in the appendix. The uniform perforated card prepared by this Committee in 1925 was selected to be used for the impairments in which

perforated cards were required. It was, of course, essential for the expeditious handling of these cards that they be on a uniform basis. In the appendix appear samples of these cards, and also the instructions sent to the companies covering the method of recording the data and the designation of the classes. The statement is there made that causes of death are to be classified according to the code used in the Medico-Actuarial Mortality Investigation. The Committee seriously considered changing the classifications so as to conform with the most recent international codification of causes of death; but there were not many changes, and as practically all the companies were using the code of the M. A. M. I., it was not considered of sufficient importance to put them to a great deal of trouble in connection with comparatively minor changes.

Under about a dozen impairments information is given according to the build of the insured. The method of measuring build for this purpose is described in the notes on the list of impairments (see appendix). It was determined according to percentage departure from the average weight for age and sex, the average having been obtained from the Medico-Actuarial Mortality Investigation.

The question of the treatment of minor impairments was discussed in the introductory pages of the Medico-Actuarial Mortality Investigation, Volume III. By "minor impairments" is meant those for which under the numerical system a small rating would be given, but not enough to cause the risk to be classed as "substandard." The point to bear in mind in considering this question is that such minor impairments are included in the data of which the basic table is composed. Consequently by including them under the respective impairment classes, the proper result is obtained. If they were not so included, the mortality ratios would tend to be slightly too low on this account. This matter was discussed in detail with illustrations in Volume III of the Medico-Actuarial Mortality Investigation. In the present studies such minor impairments were included.

The total number of entrants in the medical impairment classes, including those with a tuberculous family history, was nearly 1,100,000, the number of deaths 41,000, the average duration 4.7 years, and the average age at entry 40.2. One-third of the material contributed was classed as substandard. In the investigation of mortality according to build there were about 970,000 cards contributed. If the data in the investigation into the mortality on large-sized policies are added, the total number of entrants dealt with in these studies is about 2,100,000.

CONTRIBUTING COMPANIES

All of the companies represented in either the Actuarial Society or the Medical Directors' Association were invited to join this undertaking. Forty of them signified their intention to do so, but later one of these found that the work could not be completed in time. The thirty-nine contributing companies were as follows, arranged according to their assets at the end of the year 1926:

Metropolitan Life Insurance Company	New York City
Prudential Insurance Company of America	Newark, N. J.
New York Life Insurance Company	New York City
Equitable Life Assurance Society of the United States	New York City
Mutual Life Insurance Company of New York	New York City
Northwestern Mutual Life Insurance Company	Milwaukee, Wisc.
Mutual Benefit Life Insurance Company	Newark, N. J.
Travelers Insurance Company	Hartford, Conn.
Sun Life Assurance Company of Canada	Montreal, Canada
Penn Mutual Life Insurance Company	Philadelphia, Pa.
Ætna Life Insurance Company	Hartford, Conn.
Union Central Life Insurance Company	Cincinnati, Ohio
Provident Mutual Life Insurance Company	Philadelphia, Pa.
Connecticut Mutual Life Insurance Company	Hartford, Conn.
Canada Life Assurance Company	Toronto, Canada
Pacific Mutual Life Insurance Company of California	Los Angeles, Cal.
State Mutual Life Assurance Company	Worcester, Mass.
National Life Insurance Company	Montpelier, Vt.
Phoenix Mutual Life Insurance Company	Hartford, Conn.
Bankers Life Company	Des Moines, Iowa
Connecticut General Life Insurance Company	Hartford, Conn.
Great West Life Assurance Company	Winnipeg, Canada
Mutual Life Assurance Company of Canada	Waterloo, Canada
Equitable Life Insurance Company of Iowa	Des Moines, Iowa
Missouri State Life Insurance Company	St. Louis, Mo.
Fidelity Mutual Life Insurance Company	Philadelphia, Pa.
Home Life Insurance Company	New York City
Life Insurance Company of Virginia	Richmond, Va.
Confederation Life Association	Toronto, Canada
Berkshire Life Insurance Company	Pittsfield, Mass.
Lincoln National Life Insurance Company	Fort Wayne, Ind.
London Life Insurance Company	London, Canada
Columbian National Life Insurance Company	Boston, Mass.
Central Life Assurance Society	Des Moines, Iowa
Security Mutual Life Insurance Company	Binghamton, N. Y.
Peoria Life Insurance Company	Peoria, Ill.
Continental American Life Insurance Company	Wilmington, Del.
Sun Life Insurance Company of America	Baltimore, Md.
United Life and Accident Insurance Company	Concord, N. H.

These companies have four-fifths of the total insurance in force in the United States and Canada, and probably an even larger proportion of the insurance issued on under-average lives. Seven of the above companies did not contribute to the build study and one did not contribute to the medical impairment section of the work.

BASIC TABLE OF MORTALITY

It was considered desirable to obtain a table of mortality for standard lives during the period covered by the investigation as a measure of the expected deaths. To save labor, rather than asking all companies to prepare the material for this basic table, only the ten largest contributing companies were requested to furnish a mortality summary sheet of exposed to risk and deaths under standard business issued in the years 1909 to 1927 inclusive, carried to the anniversaries in 1928. In most companies such data can readily be prepared by amounts insured from the valuation sheets, while it would take considerable labor to make the necessary tabulation by policies. While the material in the various substandard groups investigated is by policies, it was thought by the Committee that any error in the practice of preparing the expected deaths from a table based upon amounts insured would be largely academic. Tests were made which confirmed the soundness of this view.

The companies contributing to the basic table were also asked to give the causes of death so that standard tables of causes of death might be prepared.

Material for the basic table of standard mortality was furnished in the same form as was used in the impairment classes. The statistics forming this basic table are more extensive than those of any other based upon insured lives; the death losses amounted to $1,045,529,000 and the exposed to risk $190,876,925,000.

The method of graduation was as follows: The mortality rates were first expressed in ratio to those of the American Men Select Table and these ratios summed in groups of three according to duration. The average of the ratios for years 1 and 2 was taken as applying to year 1 and the average for years 3, 4 and 5 to year 4. The subsequent central durations were 7, 10, 13, 16, 19, the last being formed of years 18 and 19. These averages were graduated at each duration by the formula obtained through rewriting expressions (12) and (13) on page 32 of the Transactions of the Actuarial Society, Volume 25 (1924) so that they appear as follows:

$$\triangle u'_{x-h} = \tfrac{1}{3}(u''_{x+h} - u'_{x-2h})$$

$$\triangle u_x = \tfrac{1}{3}(u_{x+h} - u'_{x-h})$$

where u'' = ungraded, u = graded and u' = intermediate series introduced as part of the process of grading. The values at intervening durations were inserted by an ordinary third-difference formula modified so that the inserted values never lay outside of the adjacent given values. These results were then modified so as to increase their faithfulness to the original, the factor used being $\left\{\frac{\$5{,}000{,}000 + \text{Actual deaths}}{\$5{,}000{,}000 + \text{Expected deaths}}\right\}$ where $5,000,000 was the average amount of claims for each age-group and duration. Finally the graduation formula was applied to these ratios in each age-group.

It is recommended that the graded rates of mortality be designated as "Basic Table 1909-1927." The basic table now follows, while the ungraded figures from which it was constructed appear in the appendix.

BASIC TABLE 1909-1927

Graded Rates of Mortality per 1,000

Policy Year	AGES AT ENTRY										
	15-19	**20-24**	**25-29**	**30-34**	**35-39**	**40-44**	**45-49**	**50-54**	**55-59**	**60-64**	**65+**
1	2.03	2.11	2.14	2.24	2.71	3.11	4.56	6.50	10.00	13.10	19.93
2	2.62	2.82	2.85	2.99	3.72	4.45	6.42	9.29	14.24	18.95	27.92
3	2.73	2.99	3.04	3.17	3.99	5.06	7.23	10.67	16.54	22.58	32.71
4	2.84	3.09	3.14	3.30	4.17	5.59	7.95	11.73	18.20	25.55	36.93
5	2.98	3.17	3.26	3.54	4.48	6.30	9.04	13.24	20.42	29.30	42.77
6	3.11	3.25	3.40	3.88	4.98	7.24	10.43	15.25	23.42	34.01	50.10
7	3.14	3.22	3.42	4.03	5.27	7.73	11.14	16.50	25.09	36.89	54.77
8	3.12	3.19	3.47	4.21	5.67	8.33	12.07	18.17	27.05	40.29	59.88
9	3.10	3.17	3.53	4.43	6.16	9.04	13.29	20.17	29.51	43.87	65.48
10	3.08	3.18	3.65	4.68	6.73	9.84	14.86	22.49	32.91	47.79	71.96
11	3.07	3.21	3.79	5.02	7.43	10.89	16.81	25.23	36.96	52.75	80.07
12	3.07	3.29	3.98	5.42	8.19	12.09	18.91	28.42	41.43	59.22	90.64
13	3.09	3.39	4.21	5.91	8.99	13.46	20.99	31.80	46.04	67.31	104.66
14	3.09	3.50	4.49	6.41	9.80	14.83	23.05	35.14	50.79	76.98	122.45
15	3.11	3.66	4.79	6.95	10.67	16.32	25.14	38.53	55.90	87.44	142.34
16	3.17	3.83	5.16	7.56	11.65	17.87	27.60	41.76	61.50	98.10	161.59
17	3.25	4.02	5.52	8.20	12.76	19.63	30.64	45.26	67.45	108.13	178.67
18	3.36	4.22	5.96	8.95	14.06	21.70	33.87	49.37	74.32	117.55	193.92
19	3.51	4.45	6.43	9.80	15.47	24.10	37.29	53.83	82.08	127.01	208.80

Ratios to A. M. Select Graded Rates of Mortality

Policy Year	AGES AT ENTRY										
	15-19	**20-24**	**25-29**	**30-34**	**35-39**	**40-44**	**45-49**	**50-54**	**55-59**	**60-64**	**65+**
1	.779	.744	.717	.742	.816	.765	.841	.845	.884	.788	.828
2	.761	.755	.734	.743	.817	.778	.824	.833	.865	.785	.800
3	.749	.762	.749	.748	.812	.794	.810	.816	.845	.780	.779
4	.745	.760	.758	.754	.798	.802	.799	.792	.814	.769	.765
5	.745	.752	.759	.759	.780	.801	.789	.771	.785	.757	.760
6	.745	.741	.754	.759	.766	.795	.778	.755	.766	.750	.763
7	.738	.730	.746	.757	.763	.787	.766	.751	.755	.749	.769
8	.725	.719	.741	.758	.770	.785	.763	.760	.748	.753	.776
9	.712	.712	.740	.759	.780	.787	.773	.775	.750	.755	.783
10	.702	.709	.739	.760	.796	.791	.794	.794	.769	.758	.795
11	.696	.710	.741	.767	.816	.806	.826	.819	.795	.771	.817
12	.694	.715	.748	.781	.834	.825	.854	.848	.820	.799	.855
13	.693	.722	.758	.796	.847	.844	.871	.872	.839	.838	.913
14	.691	.729	.769	.808	.853	.856	.878	.886	.853	.885	.989
15	.689	.735	.778	.816	.857	.865	.880	.894	.865	.928	1.064
16	.691	.742	.788	.823	.862	.871	.888	.891	.878	.962	1.120
17	.695	.748	.796	.830	.870	.879	.906	.889	.888	.981	1.148
18	.702	.751	.803	.836	.882	.893	.921	.893	.903	.987	1.157
19	.710	.753	.810	.846	.893	.911	.932	.897	.921	.987	1.157

Comparison of Actual with Expected Deaths.

Policy Year	Actual Deaths	Expected Deaths	Ratio
1-2	$244,639,000	$246,697,000	99.2%
3-5	314,492,000	310,752,000	101.2
6-10	307,026,000	308,600,000	99.5
11-19	179,372,000	179,480,000	99.9
All	$1,045,529,000	$1,045,529,000	100.0%

Ages at Entry	Actual Deaths	Expected Deaths	Ratio
15-29	$181,962,000	$182,616,000	99.6%
30-39	279,117,000	278,712,000	100.1
40-49	334,414,000	333,605,000	100.2
50-59	213,074,000	213,794,000	99.7
60 & over	36,962,000	36,802,000	100.4
All	$1,045,529,000	$1,045,529,000	100.0%

This table is not intended for use in calculating premiums and reserves. Some of its characteristics may be noted. The aggregate of death claims was 78% of that expected by the American Men Select Table and the ratios run in general from 70% to 90%. There is a slight dip in the mortality rates at the two youngest age-groups. At the middle and older ages the mortality for a given attained age is often considerably greater among those who have been longest insured. This may be due to the fact that the year of experience is more recent among these lives and that their relative mortality has been increasing; however it made the formation of an accurate ultimate table practically impossible, especially as a reverse tendency is noticeable at the young ages.

CAUSES OF DEATH

Deaths in the basic table used in this investigation have been recorded both as percentages of total deaths and in the form of death rates based on the exposed to risk. These appear in Tables I and II. In the comparisons made in the text the deaths are given as death rates based on the exposed to risk as compared with the corresponding death rates in the basic table. This method was used in preference to the comparison of the percentage of total deaths for the impairment in question with the corresponding percentage from the basic table. In classes with standard mortality the results tend to be the same by both methods. In a class with twice the normal mortality the ratio of death rates for any cause of death would be about twice the proportionate mortality ratio. This assumes that the distribution by age and duration was not abnormal. If the proportionate mortality ratio was used in a report with which comparison is made, this point should be kept in mind when examining the results. From the first page of Volume V of the M. A. M. I. it appears that the ratio of death rates was generally used in that investigation.

Some difficulty was experienced with regard to warfare as a cause of death. When mortality summary sheets were transmitted to the Bureau the separation of warfare from other accidental deaths was made in each company satisfactorily. For the perforated cards—none of which had been furnished in the occupational study—the M. A. code was to be used, but it did not specify warfare apart from other accidents, (codes 82-91). This point came to attention while the cards were being received at the Central Bureau. It was at once arranged that the five largest companies would use code number 95 to represent death from warfare in this investigation. The question did not affect any of the material contributed for the build study or height and weight. In the basic table 1½% of the deaths were due to warfare, and among those with medical impairments the proportion would naturally be lower since many of them could not have qualified for the fighting forces. An estimate showed that deaths from warfare in the cards contributed would not be greater than 200 and probably more than one half of them had been cared for in the manner noted above. Half of the thirty smaller organizations had already transmitted their cards and it would have been considerable labor to segregate the "dead" cards and return a part of them for re-perforation. In view of these circumstances and the fact that accident is not a cause of death of major importance in connection with medical impairments, the matter was allowed to stand without further correction. The effect is that deaths due to warfare may be slightly understated and those due to other accidents equally overstated.

A comparison of the death rates per 1,000 exposed in the present basic table and in the M. A. M. I. shows the same relationship as was noted in the occupational study. The deaths from influenza have shown the greatest increase and those from cancer, appendicitis and accident have also increased. The other causes have all shown improvements, especially typhoid, tuberculosis and cirrhosis of the liver. These facts are in harmony with the mortality statistics of the population of the United States.

The tables show fifteen of the principal causes of death, determined after comparing with the M. A. M. I. and other experiences. Other causes, although producing comparatively few deaths in the whole mass of material, may show a high proportion in certain classes. In dealing with these classes, special attention was paid to "all other causes." Thus for the larger classes of heart impairments, investigation was made of the deaths from circulatory diseases other than organic disease of the heart. This was done at the Central Bureau from the data for which cards but not summary sheets were furnished. The classes considered were primarily those where deaths from "other causes" were numerous and where the mortality ratio was higher than expected. Attention was directed particularly to causes of death which might be related to the given impairment. An example is furnished by the causes myocarditis, endocarditis and pericarditis which were in a different

code number than organic disease of the heart. In order to have a standard with which to make comparison, it was necessary to extend the basic table of deaths by cause as a percentage of total deaths. This was done by analogy with the data of the M. A. M. I. and the United States Census Bureau's mortality returns during the period covered by the present investigation. The percentages used are not published as they did not represent new material. The few significant facts which were brought to light by this supplementary investigation appear under the description of results in the various impairment classes.

TABLE I

DEATHS BY CAUSE AS PERCENTAGE OF TOTAL DEATHS

Basic Table 1909-1927

M. A. Code	Cause	Ages at Entry 15-39	Ages at Entry 40 and over	All Ages
82-91 Part	Accident not due to warfare	14.0%	7.0%	10.9%
82-91 Part	Warfare	2.7	.1	1.5
01	Typhoid	1.8	.6	1.2
05	Influenza	8.6	2.8	6.0
17	Tuberculosis of lungs	12.3	3.4	8.4
18	Other tuberculosis	1.6	.5	1.1
21	Cancer and other malignant tumors	5.1	12.8	8.6
24	Diabetes	1.1	1.4	1.2
33	Cerebral hemorrhage and apoplexy	1.9	7.4	4.3
43	Organic disease of heart	4.5	12.2	7.9
51	Pneumonia	8.5	6.1	7.5
60	Appendicitis and typhlitis	4.5	2.3	3.5
63	Cirrhosis of liver	.4	1.0	.7
68	Nephritis and Bright's disease	3.5	7.1	5.1
81	Suicide	4.0	3.6	3.9
..	All other causes	25.5	31.7	28.2
	Total	100.0%	100.0%	100.0%

TABLE II

DEATHS BY CAUSE PER 1,000 EXPOSED

Basic Table 1909-1927

M. A. Code	Cause	Ages at Entry 15-39	40 and over	All Ages*
82-91 Part	Accident not due to warfare	.495	.676	.539
82-91 Part	Warfare	.095	.010	.074
01	Typhoid	.064	.058	.059
05	Influenza	.304	.270	.297
17	Tuberculosis of lungs	.435	.328	.416
18	Other tuberculosis	.057	.048	.055
21	Cancer and other malignant tumors	.180	1.237	.425
24	Diabetes	.039	.135	.059
33	Cerebral hemorrhage and apoplexy	.067	.715	.213
43	Organic disease of heart	.159	1.179	.391
51	Pneumonia	.301	.589	.371
60	Appendicitis and typhlitis	.159	.222	.173
63	Cirrhosis of liver	.014	.097	.035
68	Nephritis and Bright's disease	.124	.686	.252
81	Suicide	.141	.348	.193
..	All other causes	.902	3.063	1.395
	Total	3.536	9.661	4.947

In addition to the above tables which were used throughout this report, the following tables have been prepared with five groups of ages at entry. They may be of interest to students of the subject.

*The death rates for all causes agree in the respective age-groups with those in the basic table (see appendix), but for all ages combined it was necessary to adjust them because the basic table was derived by amounts insured.

TABLE III

DEATHS BY CAUSE AS PERCENTAGE OF TOTAL DEATHS
Basic Table 1909-1927

M. A. Code	Cause	Ages at Entry 15-29	30-39	40-49	50-59	60 & Over
82-91 Part	Accident, not war	15.9	12.3	8.5	5.6	3.8
82-91 Part	Warfare	4.9	.5	.1	.0	.0
01	Typhoid	2.0	1.3	.7	.4	.1
05	Influenza	8.9	6.4	3.2	2.2	2.1
17	Tuberculosis of lungs	17.3	9.3	4.8	2.3	1.5
18	Other tuberculosis	2.5	1.3	.8	.3	.3
21	Cancer and other malignant tumors	3.1	7.6	12.1	15.1	14.9
24	Diabetes	1.1	1.1	1.4	1.7	1.2
33	Cerebral hemorrhage and apoplexy	.8	2.9	5.5	7.9	9.9
43	Organic disease of heart	3.0	6.0	9.9	13.5	17.3
51	Pneumonia	8.6	8.3	6.4	5.2	5.3
60	Appendicitis and typhlitis	4.9	4.2	2.8	1.6	1.0
63	Cirrhosis of liver	.2	.7	.9	1.2	1.3
68	Nephritis and Bright's disease	2.4	4.8	6.6	7.7	8.9
81	Suicide	3.5	4.8	4.3	2.9	1.7
—	All other causes	20.9	28.5	32.0	32.4	30.7
	Total	100.0	100.0	100.0	100.0	100.0

TABLE IV

DEATHS BY CAUSE PER 1,000 EXPOSED
Basic Table 1909-1927

M. A. Code	Cause	Ages at Entry 15-29	30-39	40-49	50-59	60 & Over
82-91 Part	Accident, not war	.471	.498	.630	.849	1.074
82-91 Part	Warfare	.145	.020	.011	.000	.000
01	Typhoid	.067	.053	.052	.061	.028
05	Influenza	.264	.320	.237	.333	.593
17	Tuberculosis of lungs	.513	.376	.356	.310	.300
18	Other tuberculosis	.074	.053	.059	.045	.085
21	Cancer and other malignant tumors	.092	.308	.897	2.289	4.210
24	Diabetes	.033	.045	.104	.258	.339
33	Cerebral hemorrhage and apoplexy	.024	.117	.408	1.197	2.797
43	Organic disease of heart	.089	.243	.734	2.046	4.888
51	Pneumonia	.252	.336	.474	.788	1.497
60	Appendicitis and typhlitis	.145	.170	.207	.242	.283
63	Cirrhosis of liver	.006	.028	.074	.182	.367
68	Nephritis and Bright's disease	.071	194	.489	1.167	2.515
81	Suicide	.104	.194	.399	.440	.480
—	All other causes	.613	1.092	2.359	4.949	8.797
	Total	2.963	4.047	7.410	15.156	28.253

STANDARD AND SUBSTANDARD RISKS

In this investigation it was decided to separate the substandard from the standard material. Of the 38 contributing companies six gave only standard data and five gave only the substandard section of their material. Of the remaining institutions there were three which gave one-fifth of their standard material and all the substandard. These three companies were the largest contributors giving at least 15% of the "standard" and 66% of the "substandard" data in the investigation.

As has been noted elsewhere in this report (p. 14) the average of present company ratings has been prepared for comparison with the mortality ratios in the new experience. In preparing the former both standard and substandard data were included, with the exception of a few classes which are noted in the text. After discussion it was decided in general not to combine the standard and substandard data in the tables of the present report. In the text, however, they were considered together in order to facilitate comparison with the M. A. M. I. and the average company ratings.

For all classes, the references to causes of death in the "Description of Results" have been revised so as to apply to the combined standard and substandard material adjusted by adding 60%, four times 15%, to the standard portion. This makes allowance for the four-fifths of the standard data which were omitted by the three companies referred to above. If the mortality ratios were similarly adjusted there would be only about one-fifth of the classes in which the adjustment would amount to more than 5% of the unadjusted mortality ratio. There were hardly any classes with an adjustment of as much as 10%. If such adjustments had been made, they would usually have slightly reduced the mortality ratios for the combined data, standard and substandard.

The separation of the data into standard and substandard sections made it possible to observe peculiar conditions under certain impairments. Thus under a few impairments it was observed that the bulk of standard data came from one company, while the larger part of the substandard material was supplied by one or two other companies. In some of these instances the company contributing the "standard" data did not insure under-average lives. Such a company would sometimes accept as standard a risk which another company would treat as substandard. Whether or not as the result of these conditions, the mortality ratios under several impairments were higher in the standard than in the substandard section. Examples of these are impairments (101, 102, 103, 105) and (104). An illustration of a somewhat different type of anomaly is noted under impairment (611-614).

All classes were examined where a large proportion of the data came from a few companies only. When it is evident that the mortality ratios are influenced by special standards of selection in individual companies, an explanation is given in the text dealing with the impairments affected. There are not many such instances.

PROBABLE DEVIATION DUE TO INSUFFICIENT NUMBERS

In the Joint Occupation Study (1928) published by the Committee the probable deviation of the mortality ratios was given as $\pm \frac{\frac{2}{3}}{\sqrt{\theta}}$ where θ is the expected number of death claims in the particular class. One of the members of the Committee has since derived a slightly more accurate formula, which is being used in the present report. It is $\pm \frac{\frac{2}{3}}{\sqrt{\theta'}}$ x M. R. where θ' is the actual number of death claims and M. R. is the mortality ratio by number of policies or by amounts insured, as the case may be. When the numbers are small and the class is substandard, this gives a probable deviation a little larger than the other formula. This is in harmony with the theories of the Scandinavian actuaries and mathematicians, which proceed from the formulae of Lexis and the law of small numbers.

Where the death rate from a particular cause in any medical impairment class differed from the death rate from the same cause among standard lives, a similar test was applied to determine the probability that the difference was significant. The probable deviation of the death rate was found by following the above formula. It was possible to use the same formula because of a new method by which the expected deaths were derived for comparison with the actual deaths from the respective causes. This method was one of five which were considered by members of the Committee. The expected deaths in each age group of the given impairment were first divided by cause according to the proportions in the basic table. The ratio of actual to expected deaths for each cause was then obtained by dividing the actual deaths at all ages by the sum of the expected deaths at age groups 15 to 39 and 40 and over. Causes of death are usually mentioned in the text only where this ratio differs from 100% by more than three times its probable deviation.

As a control over this procedure it was occasionally necessary to eliminate such references where special conditions nullified the effect of the principles assumed. Thus for example, the death rate from warfare was found to depend on the proportion of data contributed by Canadian companies. Again, the material was by policies while the use of probabilities applied more directly to lives. Thus in a small class a few death losses might have arisen from a single life and yet appear to have significance due to their number. In such instances the reference was either eliminated or worded so as to show the number of policies.

MORTALITY IN SOUTHERN STATES OF THE UNITED STATES

The mortality in various sections of the Southern States was thoroughly investigated in the M. A. M. I. and again in the American Men report, which confirmed the earlier results. At the request of a few members the Committee included this section as an option in the present investigation. However, only one company contributed material and it was divided into only two sections—the Northern tier and the Southern tier of the Southern States. As it made no subdivision according to counties, and could represent the selection by but one company, it seemed advisable not to publish any new material under this heading at this time.

IMPAIRMENTS FORMERLY REPORTED, NOT NOW PRESENT

"Q" following an impairment number means that although it was formerly reported present, it is not now found on examination. Four impairment groups were suggested for investigation under this heading, heart murmurs, high blood pressure, albuminuria and glycosuria. It was optional to contribute this material. Only one Company could conveniently contribute to this section, and upon review of the material it seemed to the Company and to the Committee preferable not to publish the results at this time. They could represent the method of selection in a single organization only, and the data were not of magnitude—181 dead in the four groups.

COMPARISON WITH OTHER MATERIAL

In comparing the results of the present investigation with those from other sources than the records of insured lives, it must be borne in mind that the opinion of those charged with the selection of risks has a bearing on the mortality experienced. If the opinion is unfavorable the selection is likely to be very careful, thus affecting the mortality of the company. An example of this arises in connection with the impairment of fistula in ano. Partly based on the opinion of medical experts and partly upon the results of the M. A. M. I., it was thought that fistula was harmful among underweights and of little moment among overweights. A careful selection was accordingly applied to the former and a lenient one to the latter. The present results show a relatively higher mortality among overweights than among underweights, with the impairment of fistula. These facts refer to risks which were accepted for insurance but not to the population at large. We do not know what the mortality has been among persons with fistula who did not apply for insurance or, if issued, did not accept the policy or whose applications were declined.

Another point should be kept in mind by those who are dealing with mortality derived from population statistics, namely the influence of placing cases in the standard or the substandard group. In certain impairments the mortality under approximately the same conditions would be distinctly better in the former than in the latter, as the better type would be granted standard insurance.

In any comparisons between the death rates now presented and those among the population as shown by the census bureau a fundamental difference exists. The former consists of rates of death among those who have had the impairments in question while the latter covers the probability of dying from that cause among the general population. The death rates from any given cause in the general population would therefore be expected to be lower than the corresponding rates in an allied impairment class.

When making comparisons with the M. A. M. I. it may be remembered that the latter excluded any cases made substandard on account of the physical condition or personal history of the insured, but included those substandard on account of family history. However, there was little

business classified as "substandard" in those days and the M. A. M. I. is believed to be more directly comparable with the entire data of the present report than it is with the standard section only.

For a number of classes such as "lungs unsatisfactory," "nervousness" and "dyspepsia" the results seemed to gauge the degree of selection rather than the effect of such impairments on the general population. When dealing with the standard section of the various impairment classes, it is sometimes difficult to give any interpretation to the results, when a decidedly low mortality is registered, other than the effect of very careful selection. Under the conditions which now surround the selection of risks for insurance, mortality investigations are generally for the purpose of answering two questions—(a) How have the policies issued as standard compared with the normal? (b) How has the experience on substandard business compared with the mortality expected by the companies? In any application of the results of the present investigation, the purpose of the studies and the effect of medical selection, stringent or liberal, must be considered.

Throughout the description of results reference has been made to the relative death rates from various causes. In interpreting these it should be remembered that the respective impairment classes deal with cases which had no impairment of importance other than the one referred to in the given code number, either as a history or as found on examination. Secondly the relative death rates from certain causes depend upon the duration of exposure from medical examination and issue of the insurance. Upon the whole the data regarding causes of death are statistically only a crude index with many interesting associations from the medical point of view.

COMPARISON WITH RATINGS OF INSURANCE COMPANIES

In the occupational study the average ratings of several companies were given in order that comparison might be made with the opinions held by the officers of these companies and the results of the mortality investigation. A similar comparison seems advisable in connection with the medical impairments. In many companies a series of ratings has been in use for a number of years. These were arranged by duration since attack or operation, sometimes by age of applicant and occasionally by severity of the attack. The ratings of the three largest insurance companies and the uniform ratings of the Canadian companies were taken as typical. In order to obtain sufficient material for this part of the study frequent combinations were necessary, particularly with regard to the time elapsed since the attack or the operation. The present numerical ratings for each such group were obtained from the four sources which were assumed to represent the companies as a whole. A test of the effect of adding the ratings of another large company showed that it would decrease very slightly the average ratings by the process followed. While this seems simple it called for more labor than in connection with occupations, as it was complicated by the various methods used to express the ratings. Thus one company had three groups of ratings according to age while another had a single rating for all ages. There were variations also in the groupings, according to the number of years from date of attack to application for insurance. To obtain the average was difficult when one or more companies did not accept the risk at certain ages or certain durations since the attack. To meet this situation it was assumed that when the risk was not accepted by the company the mortality was considered to be 175% above the standard, and tests showed that only a small proportion of cases were accepted at higher ratings. Another difficulty arose where some companies used temporary extra premiums and others quoted a multiple mortality rating for the same impairment. In order to obtain the average the temporary extra premiums were converted into single premiums, then into extra premiums for the whole of life and finally into percentages of the normal mortality for life.

It was also necessary to take into consideration such ratings as "+85 up." To meet this problem the distribution of medical impairment ratings in a sample of 10,000 cases furnished

by one of the largest companies, was obtained and it was then assumed that the distribution for the impairment in question would be approximately the same as that of all impairments.

It may be mentioned that the variation in medical ratings between the practices of the companies as exemplified by those of the three largest companies and the Canadian companies' practices is generally greater than was found in the occupational ratings. This is partly due to the greater amount of material available for determining the mortality under occupations than under medical impairments. In each case the average company rating included both standard and substandard material.

In several of the more composite impairment groups a check was furnished by averaging the actual ratings from the perforated cards of at least one of the large contributors. In such groups also the ratings, wherever feasible, were made to correspond with the distribution of material as it occurs in practice rather than with a hypothetical distribution by impairment and time code.

The average rating of the companies for the various impairments sometimes differs materially from the results of the present mortality investigations; yet an individual company's ratings may closely approximate to the company's own experience under the impairments in question. It must not be forgotten that comparisons are being made between the total experience of different companies and the average ratings of representative companies, not between the individual company's ratings and its experience. It may be stated in this connection that several of the largest contributors have found that, in the aggregate, their experience on under-average lives has been very close to their ratings although in certain impairments they have been more liberal or more severe than their experience indicated. In such companies, therefore, the process is not one of changing their entire ratings but of readjusting individual ratings so as to grant a greater measure of justice to certain substandard groups. The main function of these investigations, therefore, is to furnish the experience of all the companies combined as a guide for the individual company's use in the hope that it will be peculiarly valuable to those companies which have not a large enough experience of their own, or have not the necessary facilities to base their treatment on their own statistics.

SIGNIFICANTLY HIGH OR LOW CAUSES OF DEATH

From the description of results it may be observed that in any impairment class the number of causes of death which are significantly high, depends on the volume of the data and on the mortality experienced. When a large group shows a heavy mortality, as in the case of high blood pressure (344), the causes of death requiring comment are naturally numerous, while another group similar in size but with a light mortality, as for instance hysteria, nervousness and neurasthenia (253, 254, 257) or a small group with a heavy mortality, like epilepsy (204, 205) may have few causes of death significantly high because of the size of the probable deviation. It was found that a cause of death akin to the particular impairment under consideration, as in the case of organic disease of the heart under heart murmurs, usually showed a high relative death rate.

In the occupational investigation the report of which was published in 1929, there were significant causes of death in little more than half the groups, but in four-fifths of the classes in the present study some cause of death called for special mention. The significant causes of death for each impairment class were summarized in tabular form, of which the essentials are now given.

Organic disease of the heart was noted as having caused a high death rate in 30 classes, of which more than half were those comprising cases showing a circulatory impairment. This was also true of cases with asthma, with alcoholic habits and with excessive abdominal girth. A tendency towards organic disease of the heart causing significantly high death rates was shown

among cases with histories of syphilis, rheumatism and albuminuria. There were two impairments in which the death rate from this cause was low,—persistent slow pulse, 55 to 65 per minute, and simple goitre. Myocarditis, endocarditis and pericarditis, had high death rates in representative sections of the data dealing with the circulatory impairments, with excessive abdominal girth and with albuminuria.

The relative mortality from tuberculosis of the lungs was high in 24 classes, while that from tuberculosis other than pulmonary was noted in seven. High rates of mortality among cases with a history of tuberculosis, either of the lungs or of the bones and joints, were due to each type of tuberculosis. As might be expected, pulmonary tuberculosis was found to be particularly virulent among classes dealing with impairments of the respiratory organs, as for example, asthma, bronchitis, lungs unsatisfactory on examination or a history of pleurisy. Cases of anemia and of fragile appearance had a high mortality from the cause under discussion, as did also cases of rapid pulse.

Bright's disease was of importance in 27 classes. This cause of death was significantly high in classes dealing with a history of renal colic or of nephritis, as might be expected, and also among cases of high blood pressure and of excessive abdominal girth. There was also a tendency towards a high death rate from Bright's disease among groups composed of cases with apex murmurs, fistula in ano, albuminuria and alcoholism and with histories of syphilis or gallstones.

A high death rate from pneumonia was found in 20 classes, among which were those dealing with diseases of the respiratory system, with high blood pressure, with alcoholic habits and with fragile appearance. This cause of death also affected adversely cases with a history of syphilis, with an apex murmur or with a record of albuminuria. Few deaths from pneumonia were found among the data on slow pulse (55 to 65 per minute) or on a history of renal colic, without operation. Influenza was noted for its virulence in 10 classes with an incidence similar to that of pneumonia.

Among the 16 classes for which the death rate from apoplexy was significantly high were those dealing with hysteria, with high blood pressure, with casts alone or combined with albuminuria and with a family history of apoplexy. The number of deaths due to apoplexy among cases of alcoholism, of excessive abdominal girth, of histories of gallstones, fistula in ano, renal colic and of albuminuria tended in each case to be above normal. The death rate from the cause under consideration was low among cases of slow pulse, 55 to 65 per minute.

Cancer was important in 14 classes including cases with histories of cancer with operation, papilloma and hysterectomy. The last mentioned may have been due to the fact that independent of any medical impairment, cancer as a cause of death is nearly twice as frequent among women as among men. Other classes with a high death rate from cancer were those involving a rapid pulse, high blood pressure and histories of tuberculosis of the lungs, syphilis and gastric ulcer. Apparently the question of build does not markedly affect the susceptibility to cancer, as cases of fragile appearance and those with excessive abdominal girth showed a like tendency toward a high death rate from this cause. This question was dealt with from a different point of view but with a similar result, on page 34 of Vol. II of the M. A. M. I.

As might be expected, cases with a nervous disorder such as hysteria, nervousness or nervous prostration, showed a high death rate from suicide, which was an important cause of death in 10 classes in all. Classes dealing with alcoholism and with albuminuria were included in these ten. There was a tendency towards a high death rate from this cause in groups comprising cases of a history of syphilis or of pleurisy. Few deaths were due to suicide among the data on slow pulse, 55 to 65 per minute.

The death rate from diabetes was high in eight classes including those comprising glycosuria, excessive abdominal girth, diabetes in the family history, a history of fistula in ano with operation and a history of renal colic.

There were seven classes in which the death rate from accident was high. Included in the seven were those of alcoholism and of blindness in one eye.

Cirrhosis of the liver was prominent in five classes including alcoholism, high blood pressure, history of hemorrhage of the lungs and excessive abdominal girth.

The remaining causes of death were each significantly high in less than five classes and therefore a discussion of them is omitted.

MORTALITY BY POLICIES VS. AMOUNTS INSURED

In determining the practice of companies based on the results of this investigation it should be remembered that the material has been compiled by number of policies and not by amounts insured. Where the average policy is likely to be large, allowance should be made for possible adverse selection. In an endeavor to assist the companies in determining the allowance to be made for the difference between the mortality by policies and by amounts insured the records have been compiled of over 115 investigations of the mortality among medical impairments conducted during the last fifteen years by three of the largest contributing companies. These covered principally albuminuria, glycosuria, biliary colic, renal colic, family history and heart impairments. For all impairments combined the mortality was 147% by amounts insured and 140% by policies. In the groups of heart murmurs, however, the excess of mortality by amounts over that by policies was 28% of the latter.

With regard to the important matter of build, the question arises, what modification of the results should be made to cover any probable adverse selection by amounts insured. The material of the three companies referred to contained four classes of underweight and five of overweight. In the former the mortality by amounts was equal on the whole to that by policies. Each of the classes of overweights, however, showed higher mortality by amounts with an average excess of 29%, practically the same difference as was found for heart impairments.

The conditions for medical impairments are different from those for occupations. In the Joint Occupation Study (1928) no adjustment of the mortality by policies was recommended to obtain the mortality by amounts insured. This procedure was justified by an examination of the data under 160 occupational classes investigated by the same three companies. On the whole there was only 1% excess mortality by amounts and the difference was not significant except in seven of the classes. This was probably due to the fact that the average policy is small in the substandard occupational classes while it may be distinctly large under medical impairments treated as substandard, as policies are more often issued for substantial amounts.

DESCRIPTION OF RESULTS IN EACH CLASS

The results of the medical impairment section of this investigation are now summarized. Various combinations of the classes are made so as to bring out the significance of the data. However, mention is made of each of the original classes, noted in the appendix, and as much information is given in each case as the size of the material seems to justify.

In the following comments the references to causes of death refer to the entire impairment class, unless otherwise specified. (See "Standard and Substandard Risks.")

In the detailed tables some of the age-groups and durations show only scanty data with mortality ratios which may vary widely from the average of the class, but the figures are given in the usual form for the convenience of future investigators. At this point mention may be made of the method followed in deriving the average age at entry which appears in each of the detailed tables. It is believed to be a slight improvement over the method used in the occupational study. First the average duration was obtained as the quotient of the number exposed weighted by the respective years of duration divided by total number exposed. Then the equivalent expected rate of mortality was derived as the ratio of expected dead to exposed. By entering the basic table with this rate of mortality at the given duration the corresponding age at entry was determined.

Any average age which was five or more years different from age 40, the average age for the entire investigation, was considered significant and was mentioned in the description of results. In general the age at entry quoted in the description of results applies to all the data in each impairment class. In a number of cases, however, the average age was significant in the substandard section but not for standard and substandard data combined. In these classes the average age for the substandard section was referred to. The average age at entry is also shown in each of the detail tables.

In accordance with expectations, impairments with a high average age included high blood pressure, gall stones, infected gall bladder, casts in urinalysis, inflammation of the prostate gland and abdominal girth greater than chest expanded. Impairments with a low average age included tuberculosis, infantile paralysis, organic heart murmurs, slow pulse, pleurisy, albuminuria, goitre and spinal curvature. It is curious that organic heart murmurs and slow pulse are found in this group but the result may be accounted for by the influence of selection.

The following titles have been used in designating certain of the causes of death in the text: cancer and other malignant tumors are called cancer; cerebral hemorrhage and apoplexy are called cerebral hemorrhage; appendicitis and typhlitis are called appendicitis; nephritis and Bright's disease are called Bright's disease.

It is hardly necessary to remind readers of this report that a mortality ratio of 100% is normal since the expected deaths represent the average experience of the companies under standard risks. The excess of mortality ratio over 100% represents therefore the extra mortality.

Syphilis

The principal interest which attaches to this study lies in the circumstance that most of the cases studied have been subjected to the more recent forms of treatment. It has been stated that the early disturbances of the disease have tended to become less frequent and the later developments—paresis, arteriosclerosis and locomotor ataxia, more common. Unfortunately the short duration of the present study does not give full effect to the later developments of this disease.

"Cured" implies freedom from any active symptoms of the disease as indicated by two or more negative Wasserman tests.

(101) Syphilis, no details.
(102) Syphilis, not cured, thorough treatment.
(103) Syphilis, not cured, not thorough treatment.
(105) Syphilis, cured, not thorough treatment.
B One attack, within 2 years of application.
C One attack, within 3, 4, 5 years of application.
D One attack, within 6-10 years of application.
F One attack, over 10 years prior to application.
G Initial lesion.
H Slight secondary symptoms.
J Marked saturation.

B with G-J	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
Substandard	2,258	18	8.72	206% ± 33
C with G-J				
Substandard	4,146	22	16.43	134% ± 19
D with G-J				
Standard	1,858	12	8.19	147% ± 28
Substandard	6,516	47	30.97	152% ± 15
F with G-J				
Standard	4,225	46	35.00	131% ± 13
Substandard	11,054	104	79.17	131% ± 9
B, C, D, F each with G-J				
Standard	7,269	69	48.76	142% ± 11
Substandard	23,974	191	135.29	141% ± 7

In the standard sections of B and C only 3 and 8 deaths, respectively, were recorded.

Out of 151 applications under the death losses which were examined, the severity of the impairment was not specified in 29%. Of the balance, 69% had a history of initial lesion, 29% slight secondary symptoms and only 2% marked saturation. Eighty per cent of the deaths in the substandard section were examined to determine the impairment class in this group of impairments. They were about evenly divided among the four impairments, with a tendency to have more in (103) and (105). Slightly more than half the data were in the groups with a definite history of syphilis not cured.

The company ratings averaged 190%, 170%, 165% and 165% for B, C, D and F, respectively. The corresponding mortality ratios in the investigation were 203%±30, 147%±18, 151%±14 and 131%±7 for B, C, D and F, respectively. In the M. A. M. I. a comparable class showed mortality ratios of 284%±28 for C, 212%±19 for D and 129%±10 for F.

In a combination of all cases in this class the death rates from organic disease of the heart and from Bright's disease were 2 and 2¼ times the normal, respectively.

Among the substandard cases of the entire group, the mortality ratio was higher at the young ages than at the older ages, and among the standard the same tendency prevailed.

For general comments on this and the next impairment, see the summary following (104).

(104) Syphilis, cured, thorough treatment.
B One attack, within 2 years of application.
C One attack, within 3, 4, 5 years of application.
D One attack, within 6-10 years of application.
F One attack, over 10 years prior to application.
G Initial lesion.
H Slight secondary symptoms.
J Marked saturation.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
C with G-J				
Substandard	2,684	17	10.39	164%±26
D with G-J				
Standard	1,940	18	8.57	210%±34
Substandard	6,276	77	31.05	248%±20
F with G-J				
Standard	3,352	40	29.00	138%±15
Substandard	10,782	66	67.40	98%± 8
B, C, D, F each with G-J				
Standard	6,401	70	43.02	163%±13
Substandard	20,247	166	110.97	150%± 8

In group B, only 2 and 6 deaths were recorded in the standard and substandard sections, respectively. In the standard section of C, only 10 deaths were recorded, giving a mortality ratio of 228%±48. The mortality ratio for this section is higher than that for the corresponding substandard data. This unexpected result is shown again in F and in the total class. Most of the "standard" cases were contributed by companies which do not accept risks at extra premiums.

Out of 137 applications under the death claims which were examined the severity of the impairment was not specified in one-fourth. Of the balance, 45% had a history of initial lesion, 53% slight secondary symptoms and only 2% marked saturation.

The company ratings averaged 155%, 150%, 150% and 145% for B, C, D and F, respectively. The corresponding mortality ratios in the investigation were 250%±60, 183%±24, 240%±17 and 110%±7 for B, C, D and F, respectively. The M. A. M. I. showed mortality ratios of 139%±25 for C, 174%±19 for D and 217%±20 for F.

In a combination of all the data in this class, the death rates from tuberculosis of the lungs, pneumonia and cancer were 2½, 2 and 1¾ times the normal, respectively. Both appendicitis and suicide showed a death rate 2¼ times the normal. In the M. A. M. I. also, suicide was a significantly high cause of death.

In the substandard material there was a clear indication of increasing relative mortality as the duration advanced.

Summary of Classes of Syphilis

Cases of "cured syphilis" appear slightly worse than the others. However, a similar result appeared in the M. A. M. I. as may be seen from the following table in which the company ratings have been weighted in proportion to the exposed to risk and in which the first two columns exclude standard business.

	Mortality Experienced Substandard	Average Company Rating Substandard	M. A. M. I.
(101, 102, 103, 105) C-F	137%±7	165%	174%±9
(104) C-F	147%±7	145%	188%±9
(101-105) C-F	141%±6	155%	179%±7

It may be noted that the company ratings were lower than the M. A. M. I. experience. The difference between the new experience and the company ratings may be partly accounted for by the short duration. For history of syphilis within two years of application the mortality experienced was somewhat higher than the average of company ratings.

In a combination of all the data dealing with syphilis, the death rate from Bright's disease was twice the normal and those from tuberculosis of the lungs, pneumonia and suicide were each 1¾ times the normal. Cancer and organic disease of the heart each showed death rates 1½ times the normal, while the death rate from accident was 1¼ times the normal. In a representative section which included about one-third of the standard data and half the substandard data there were no deaths from locomotor ataxia and only one from paresis and one from the group of heart impairments, myocarditis, endocarditis and pericarditis. The mortality was heavier at the younger ages at issue than at the older ages and increased as the duration advanced. The latter result tends to confirm the belief that the virulent effects of this disease may have been deferred to a period some considerable time after infection.

(111) Acute articular rheumatism.
B-C One attack, within 5 years of application.
D-F One attack, over 5 years prior to application.
G-H Two or more attacks, last within 5 years of application.
J-K Two or more attacks, last over 5 years prior to application.
(X1) Operation recorded for removal of tonsils prior to application.
(Y1) All others.

		Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
(X1) B-K	Standard	12,514	38	48.97	78%± 9
	Substandard	2,657	15	9.52	158%±27
(Y1) B-C	Standard	64,479	413	341.54	121%± 4
	Substandard	14,398	95	64.84	147%±10
(Y1) D-F	Standard	77,349	553	498.49	111%± 3
	Substandard	7,435	61	40.22	152%±14
(Y1) G-H	Standard	7,747	65	48.82	133%±11
	Substandard	8,575	79	48.74	162%±13
(Y1) J-K	Standard	7,482	65	50.66	128%±10
	Substandard	1,814	13	9.77	133%±24
(Y1) B-K	Standard	157,057	1,096	939.51	117%± 2
	Substandard	32,222	248	163.57	152%± 6

In the standard section of (X1), only 4 deaths and 1 death were recorded in G-H and J-K, respectively. In the substandard section of (X1) there were only 8, 1, 5 and 1 deaths recorded for B-C, D-F, G-H and J-K, respectively.

The company ratings averaged 140% and 115% for B-C and D-F, respectively, and 165% and 120% for G-H and J-K, respectively. The M. A. M. I. mortality ratios were practically the same as those of the present experience for each duration with one attack, but for cases with two or more attacks they showed the anomaly of lower mortality than for one attack. Combining the present material for the standard and substandard data, irrespective of whether the operation for the removal of the tonsils had been recorded or not, gave mortality ratios of 124%±4 for B-C, 112%±3 for D-F, 146%±7 for G-H and 126%±9 for J-K.

In (X1) no cause of death was significant. In (Y1) the death rates for organic disease of the heart and Bright's disease were 2 and 1½ times the normal, respectively.

For (X1) and (Y1) combined, in the M. A. M. I., the death rate from organic disease of the heart was markedly above the normal, especially at the younger ages where it was 3 times the normal, a result similar to that found in the present investigation.

The mortality ratio decreased as the age at issue advanced among standard and substandard, except in the youngest age-group of the latter. Among the large group of standard risks the relative mortality was practically stationary, except for policy years 11-19, while among the smaller group, the substandard, it decreased as the duration increased.

With regard to standard cases, there was a lower mortality among those who had their tonsils removed than among the others.

The Statistical Bulletin of the Metropolitan Life Insurance Company for August 1930 reported a decline of 40% during the last ten years in the death rate from this disease for the general population as well as for the wage-earners; this has been ascribed to the improved attention to focal infections and oral hygiene.

(141) Tuberculosis of bone or joint.

This impairment has been investigated first regarding duration since the attack and then regarding the degree of underweight or overweight as compared with the average build for standard lives.

C One attack, within 3, 4, 5 years of application.
D One attack, within 6-10 years of application.
F One attack, over 10 years prior to application.

		Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
C	Substandard.....	1,660	28	6.36	440%±57
D	Substandard.....	2,809	49	10.86	451%±45
F	Standard.....	8,779	43	48.91	88%± 9
	Substandard.....	16,501	77	72.00	107%± 9
C, D, F	Standard.....	10,674	46	58.13	79%± 8
	Substandard.....	20,970	154	89.22	173%± 9

In the standard sections of C and D only 1 and 2 deaths, respectively, were recorded. A combination of the standard and the substandard data of group C showed a mortality ratio of 303%±36; a similar combination for D showed a ratio of 302%±27.

The marked difference in the relative mortality in the substandard sections of D and F may have been due to the long period elapsed in the latter since the date of the attack.

The company ratings averaged 220%, 150% and 120% for C, D and F, respectively. In the M. A. M. I. a combination of all cases showed a mortality ratio of 136%±8, the same result as in the new investigation.

In the entire class the death rates from tuberculosis of the lungs and from other tuberculosis were 2 and 8 times the normal, respectively. In the M. A. M. I. the death rate from tuberculosis of the lungs was normal, but that from other forms of tuberculosis was decidedly higher than normal.

Among the substandard cases of the entire class, the mortality ratio was higher at the young ages than at the older ages, and also decreased as the duration advanced.

In the substandard section the average age at entry was 35, five years below the general average.

From the above table it is evident that until a number of years have elapsed after date of attack, this impairment is more serious than had been supposed.

(141) Tuberculosis of bone or joint.

C-F One attack more than 2 years prior to application.

(a) 20% or more underweight.

(b) All others.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
(a) Substandard	1,949	28	7.98	351%±46
(b) Standard	9,872	41	53.18	77%± 8
Substandard	19,130	128	81.66	157%± 9

In the standard section of (a) only 3 deaths were recorded. A combination of all cases in this class showed a mortality ratio of 139%±7.

The company ratings averaged 200% and 130% for (a) and (b), respectively. In the M. A. M. I. a combination of all cases showed a mortality ratio of 136%±8.

(142) Tuberculosis of glands of neck.

C-F One attack, more than 2 years prior to application.

(a) 20% or more underweight.

(b) All others.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
(b) Standard	8,508	38	40.53	94%±10
Substandard	4,766	25	17.24	145%±19

In (a) the data were small and only one death was recorded.

The company ratings averaged 185% and 150% for (a) and (b), respectively.

No cause of death was significant. The death rate from tuberculosis of all kinds was not higher than normal.

A comparable group in the M. A. M. I. showed a mortality ratio of 132%±13.

(152) Cancer with operation.

C One attack, within 3, 4, 5 years of application.

D One attack, within 6-10 years of application.

F One attack, over 10 years prior to application.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
C, D Substandard	1,375	23	8.18	281%±39

In the standard sections of C and D only 4 and 2 deaths, respectively, were recorded. In F there were only 1 and 5 deaths recorded for the standard and substandard sections, respectively. For the standard and substandard combined, the mortality ratios for groups C and D were 373%±60 and 192%±36, respectively. For group F the ratio was 148%±40 and for the entire class the ratio was 235%±26.

The company ratings averaged 265%, 190% and 130% for C, D and F, respectively, and 200% for the entire class when these figures were weighted by the exposed.

Of the entire group with 35 deaths there were 16 deaths from cancer against less than two expected.

The site of the cancer was noted in 21 of the deaths; of the 17 men, five had cancer on some part of the face, 9 in the region of the groin or intestines and 3 elsewhere. As to the 4 women the cancer was of breast or uterus in each case.

In the entire class (152), among those 30% or more overweight, there were no deaths recorded. The company ratings averaged 220%.

It is regrettable that the amount of the material was so small in view of the grave importance of this subject.

(153) Epithelioma, except of face.
C-D One attack, within 3-10 years of application.

Only one death was recorded under this impairment. The company ratings averaged 160%.

(154) Epithelioma, of face and lips.
C-D One attack, within 3-10 years of application.

Only nine deaths were recorded under this impairment with a mortality ratio of 92%±20. Two deaths were in the standard section and seven in the substandard. The company ratings averaged 185%.

(158) Papilloma.

Including all parts of the body which were affected by papilloma the total number of deaths was only 18 against an expected number of 14. When subdivided according to (X1) larynx, (Y1) bladder and (X2) other parts, it can be readily seen that the amount of data was too small to be of much value.

In the foregoing would appear a range from mild growths to questionable ones, on the larynx or tongue for example, which might be pre-cancerous. Very little help, therefore, can be obtained from the study in determining ratings. The companies did not, however, generally accept applicants with a history of papilloma of the bladder within two years of the occurrence of the impairment, nor applicants with papilloma of the larynx where the tumor had not been removed.

For applicants generally accepted, the company ratings for bladder cases averaged 155% for C-D and for larynx cases where the papilloma had been removed, 130% for B-D.

Only five and three deaths, respectively, were recorded for the groups where the larynx and the bladder were affected. Among the cases where other or not specified sites were affected there were ten deaths with a mortality ratio slightly lower than for the entire group.

Five of the deaths were due to cancer, considerably more than the normal proportion.

As some companies determine ratings for this impairment according to whether or not the papilloma was operated on, ten of the death losses were examined on this point and nine were found to have had the operation prior to application for insurance.

(181) Anemia or chlorosis.

The extent of anemia is measured by the percentage of hemoglobin; thus slight anemia was characterized by 70 to 80% hemoglobin, while moderate anemia was classed as 60 to 69%. Cases of marked anemia, below 60% hemoglobin, were seldom accepted for insurance.

X (G-H) Found on examination with 60% to 80% hemoglobin.
(a) 10% or more underweight.
(b) 9% under to 9% overweight.
(c) 10% or more overweight.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
(a), (b), (c) Substandard.....	4,060	24	18.11	133%±19

In the standard section there were only two deaths recorded. In the substandard section as there were only 8 deaths in (a), 13 in (b) and 3 in (c), the material was combined. Combining all the data (26 deaths) gave a mortality of 130%±17.

The company ratings averaged 140% for weight group (b), which contained one-half of the total material. The ratings were differentiated by severity of the anemia and not by build. Of fourteen dead in a representative portion of the substandard section twelve were found to be in class G, 70 to 80% hemoglobin, while two were in H, 60-69% hemoglobin. The average of company ratings has been adjusted to allow for this distribution.

Of the twenty-six deaths, six were due to tuberculosis of the lungs, 3½ times the normal proportion.

(200) Encephalitis lethargica.

This impairment is now given the code number (264).

(204) Epilepsy, petit mal.
(205) Epilepsy, grand mal.
X-B Found on examination, or one attack within 2 years of application.
C-D One attack, within 3-10 years of application.
G-J Two or more attacks, last within 10 years of application.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
G-J Substandard.....	3,945	46	18.97	242%±24

In groups X-B and C-D only 3 and 2 deaths, respectively, were recorded. If all the facts had been obtained it is probable that practically the entire number of entrants would have appeared in group G-J. There were no deaths among the few standard cases of G-J.

For the entire class the company ratings averaged 230% while the mortality ratio under all the data was 202%±18. In the M. A. M. I. a comparable group showed a mortality ratio of 127%±14.

From the material contributed by one of the large companies, it was found that out of 39 deaths in this impairment class, 11 (28%) were due to epilepsy. In the M. A. M. I. out of 38 deaths, 7 (18%) were due to epilepsy.

It was not possible to separate "petit mal" from the other cases, without consulting the original application papers. For three-fourths of the deaths, however, this was done and it was found that about 65% were petit mal and 35% grand mal.

In a recent German study* which covered a 25 year period and included 520 patients, epilepsy was found relatively more frequently among men than among women. Of the deaths, 30% (3 times the normal) were due to tuberculosis, 17% (1¼ times the normal) to various heart impairments, 20% to epileptic falls and 12% to a state of epilepsy. The average length of time the epilepsy lasted was 23 years.

(222) Fractured Skull.

B-F At any time prior to application.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
Standard	13,897	54	61.70	88% ± 8
Substandard	3,040	22	11.38	193% ± 27

The company ratings averaged 120%. These cases were generally declined within one year after the fracture occurred and the average rating was for the subsequent period.

Accidents, not war, caused one-fourth of the total number of deaths (1¾ times the normal proportion). The mortality in the first two policy years and at ages under 30 was distinctly high, but at later durations and higher ages it was below normal.

This appears to be the first time that the mortality under this impairment has been investigated.

(253) Hysteria.
(254) Nervousness.
(257) Neurasthenia or Nervous Prostration.

X-B Found on examination, or one attack within 2 years of application.
C-F One attack, more than two years prior to application.
G-K Two or more attacks, at any time prior to application.

		Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
X-B	Standard	33,868	233	189.60	123% ± 5
	Substandard	6,893	49	32.61	150% ± 15
C-F	Standard	66,255	422	462.62	91% ± 3
	Substandard	7,727	58	44.28	131% ± 12
G-K	Standard	4,470	20	33.37	60% ± 9
	Substandard	2,049	18	10.10	178% ± 28
X-B, C-F, G-K	Standard	104,593	675	685.59	98% ± 3
	Substandard	16,669	125	86.99	144% ± 9

The general practice was to decline cases with these impairments found on examination.

For group X-B the company ratings averaged 170%, for group C-F 120% and for group G-K 150%. The M. A. M. I. showed a mortality ratio of 119% ± 8 for the first of these groups.

Among the cases in X-B the death rate from suicide was three times the normal and in C-F twice the normal. In the M. A. M. I. the mortality from that cause was greater than the normal. Among the cases in group X-B the death rate from accident was normal while it was

*Epilepsy: (Allg. Ztschr. f. Psychiat. 89 (7)-1928), Ostmann.

distinctly below the normal in group C-F. The death rate from cerebral hemorrhage was slightly above the normal in group X-B, but distinctly so in group C-F.

The importance of the impairment seems to decrease as the age at issue advances.

This class includes both mild and severe cases; the relatively low mortality shows careful selection.

(263) Paralysis, Infantile (Poliomyelitis).
B-F One attack at any time prior to application.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
Standard	34,144	143	136.24	105% ± 6
Substandard	7,298	35	28.24	124% ± 14

The company ratings averaged 145%. In the M. A. M. I. this class had a mortality ratio of 105% ± 11.

No cause of death was significant. It is interesting to note that only one death, caused by inflammation of the brain, resulted from diseases of the nervous systems, including paralysis.

The average age at entry was 35, five years below the general average.

(264) Encephalitis lethargica.
B-F One attack at any time prior to application.

The number exposed was small and only one death was recorded. The company ratings averaged 195%.

Impairments of the Heart

A heart murmur is classified in the code according to (a) the area in which it is best heard, (b) the phase in the pulse beat at which it occurs, (c) whether constant or inconstant, (d) whether transmitted, and if so, in what direction.

Basic murmurs may be heard in either the aortic or the pulmonic area. In life insurance practice nearly all murmurs occur at the left side of the heart. A systolic murmur may be detected when the left ventricle is contracted, a diastolic murmur at the point of expansion, and a presystolic murmur just previous to the moment of contraction. One of the chief reasons for the method of dividing heart murmurs in the code is to distinguish organic or structural defects from functional derangements.

The circulatory impairments (301 to 339) have two characteristics which may be mentioned at this point: (a) the code provides G or H to represent slight or moderate hypertrophy in association with heart murmurs, and this letter is used with X, found on examination. It seems probable that prior to the introduction of the new code (1925) and especially in communities other than large cities, some cases with slight hypertrophy were considered without hypertrophy (X) in the absence of information as to the degree of enlargement. This may explain the results in some of the classes, where the mortality ratio without hypertrophy is about the same as for XG and the latter lower than XH, see (302) and (305-306); (b) the highly differentiated heart murmurs were probably more often found in the case of holders of large than of small policies. Such a situation is indicated by the specialized diagnosis such as pericarditis, embolism, myocarditis used by the physician certifying to the death of the insured rather than the general term, organic heart disease. The comparison of actual to expected deaths from these causes was made by using the expected number among ordinary policyholders, without special application to large amounts insured. With this explanation the text may be better understood.

In the American Journal of Public Health for September 1928, there appeared a study of 1300 cases of heart diseases which were divided into three general types, rheumatic, syphilitic and arteriosclerotic. The proportions for the first and third were 44% and for the second 12%. The question naturally arises how these would appear in the medical impairment code. The

rheumatic type has been designated by a code number (303) which combines a diagnosis of mitral regurgitation with rheumatism. In the present investigation those with a history of other infections were analyzed and it was found that they did not include syphilis. A person with heart disease and also with a history of syphilis would come under two code numbers—the former combined with (101 to 105). These are not covered in the present investigation as the amount of material would be very small. The arteriosclerotic type of heart murmur could be coded by combining (343) with a heart murmur, although persons with high blood pressures (344) might be found in many cases to be of the arteriosclerotic type. This would be looked for especially in the higher readings such as 45 or more Mm. above the average for the age.

(301) Apex murmur, systolic, constant, not transmitted to the left.
X Found on examination.
XG Found on examination with slight hypertrophy.

		Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
X	Standard.....	3,954	16	17.15	93%±16
	Substandard.....	30,943	234	149.74	156%± 6
XG	Substandard.....	4,372	39	19.44	201%±22

In the standard section of XG there was only one death.

The company ratings averaged 140% for X, and 180% for XG.

In the entire class, the death rate from organic disease of the heart was 5 times the normal. In a representative section of the material there were 25 deaths from myocarditis, endocarditis and pericarditis against an expected of less than 2. From Bright's disease the death rate was twice the normal. Accidents, not war, were significantly low at (½) the normal.

(302) Apex murmur, systolic, constant, transmitted to the left.
X Found on examination.
XG Found on examination with slight hypertrophy.
XH Found on examination with moderate hypertrophy.

X is divided into the following two groups:

(X1) Occupation of insured involves light work; clerical, managerial, and profcssional service, also such as is generally done in retail stores and in dressmaking establishments.

(Y1) Occupation of insured involves heavy work; carpenters, painters, bricklayers and other artisans, farmers, lumbermen, steelworkers and laborers. Under the rules all of these were rated "standard" for insurance as regards occupation.

		Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
X (X1)	Substandard....	107,285	1,095	502.69	218%± 4
X (Y1)	Substandard....	11,349	136	46.39	293%±18
X (X1) (Y1)	Substandard....	118,634	1,231	549.08	224%± 4
XG	Substandard....	37,708	394	168.45	234%± 7
XH	Substandard....	9,122	196	41.20	476%±24
X(X1) X(Y1) XG, XH					
	Standard.....	4,580	19	16.50	115%±17
	Substandard....	165,464	1,821	758.73	240%± 5

In the standard section of XG there were four deaths recorded and none in either X(Y1) or XH. In the standard section of X(X1) there were 15 deaths with a relative mortality of 123%±21.

In accordance with anticipation, the mortality was more favorable among those doing light work. It may be noted that the mortality among those doing light work was distinctly higher than in the entire material contributed by Rogers and Hunter in 1924. The latter had a mortality ratio of 188%±4 as against 218%±4 in this part of the new data.

The company ratings averaged 175%, 200% and 235% for X, XG and XH, respectively.

The death rates from organic disease of the heart and Bright's disease were 8½ and 2½ times the normal, respectively. The death rates from pneumonia and influenza were 2¼ and 1¾ times the normal, respectively.

In representative sections of the material there were 223 deaths from myocarditis, endocarditis and pericarditis, against an expected of less than 6, and 29 deaths from embolism and thrombosis against an expected of less than one.

The mortality ratios were generally lower at the old ages than at the younger ages.

The Statistical Bulletin of the Metropolitan Life Insurance Company—August 1930—showed at ages under 45 a *yearly* decline in the death rate from heart disease of about 2% during the period covered by the present investigation. At ages above 45 there had been upon the whole an increase of about half this proportion yearly. These figures were for the industrial department and might be considered in relation to class (302) X(Y1). It was suggested that "the saving in mortality was due to checking rheumatism and other infections."

(303) Apex murmur, systolic, constant, transmitted to the left, with history of rheumatism or other infectious disease.

X Found on examination.

X(G-H) Found on examination with slight or moderate hypertrophy.

(X1) With history of rheumatism with tonsillectomy recorded.

(Y1) With history of rheumatism without tonsillectomy recorded.

(X2) With history of other infection with tonsillectomy recorded.

(Y2) With history of other infection without tonsillectomy recorded.

		Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
X	Substandard (X1)	1,810	20	6.16	325%±49
	Substandard (Y1)	18,711	287	86.47	332%±13
	Substandard (X2)	3,444	27	12.56	215%±28
	Substandard (Y2)	9,470	76	42.04	181%±14
	Total.....	33,435	410	147.23	278%± 8
X(G-H)	Substandard (X1)	1,127	20	3.86	518%±78
	Substandard (Y1)	7,609	138	33.56	411%±25
	Substandard (Y2)	4,649	34	19.53	174%±19
	Total.....	13,385	192	56.95	337%±17
X, X(G-H)	Substandard (X1)	2,937	40	10.02	399%±44
	Substandard (Y1)	26,320	425	120.03	354%±11
	Substandard (X2)	5,042	34	18.49	184%±20
	Substandard (Y2)	14,119	110	61.57	179%±11
	Total.....	48,418	609	210.11	290%± 9

Among the standard cases without or with hypertrophy there was very little exposure. Among those without hypertrophy there were only 10 deaths for groups (X1), (X2), (Y1) and (Y2), combined; among the standard cases with hypertrophy, groups (X1) and (X2) had no deaths, while groups (Y1) and (Y2) had 3 deaths.

The company ratings for cases without hypertrophy averaged 235% when there was a history of rheumatism, and 220% when there was a history of another infection. For cases with hypertrophy, the company ratings averaged 265% when there was a history of rheumatism and 255% when there was a history of another infection. The high mortality among persons with mitral regurgitation and with a history of inflammatory rheumatism was noted in 1919 (T. A. S. A., Vol. XX, p. 83) and in 1922 (T. A. S. A., Vol XXIII, p. 347). In the paper of 1922, a group of mitral regurgitation with a history of inflammatory rheumatism showed a relative mortality, in ratio to the company's standard of 270%±11 for cases with little or no hypertrophy and 360%±25 for cases with moderate hypertrophy.

Among all the substandard cases of the present material the death rate from organic disease of the heart was 15 times the normal. In a representative section of the data, there were 65 deaths from myocarditis, endocarditis and pericarditis, against less than two expected deaths and 8 deaths from angina pectoris against less than one expected. The death rates from pneumonia and influenza were 4 and 1¾ times the normal, respectively.

The mortality ratio in each group was higher at the young ages than at the older ages.

The above figures do not show any clear-cut influence of tonsillectomy on mortality. It is evident that rheumatism is much more important than other infections, and that the difference is greater than had been generally provided for. The group of "other infections" experienced a mortality better than the company ratings while the reverse was the case with the rheumatic type. Combining all the data with or without hypertrophy and comparing with the company ratings weighted according to the exposed to risk, the following table results:

History of	Experience	Average Ratings
Rheumatism	358%±11	245
Other Infections	180%±11	230
Total	290%± 9	240

Another table may be formed by separating those with hypertrophy from the others:

	History of	Experience	Average Ratings
X	Rheumatism	331%±13	235
	Other Infections	189%±13	220
X(G-H)	Rheumatism	422%±21	265
	Other Infections	161%±16	255

The effect of the hypertrophy has been much worse among those with the history of rheumatism than of other infections.

Mention may be made of "other infections" obtained from a representative section of the material, namely,—tonsillitis, chorea, measles, typhoid fever, scarlet fever. These were confirmed by a similar list in a recent Public Health Service Bulletin.* There were no cases of a history of syphilis in our material. The five impairments just listed appear in the order of their importance as shown by the data of the present study.

The most important observation to be made regarding the combination of heart murmur with history of rheumatism is that the extra mortality is considerably greater than that of the two separate impairments. An exact comparison cannot be made because data are available for acute rheumatism (111) but not for chronic rheumatism (112), both of these having formed part of impairment (303). The following table may serve, however, as a gauge of the extent of the extra mortality in the combination:

*Health News—Nov. 19, 1929, Washington, D. C.

	Experience	Average Company Rating	Excess Points
(111) B-K	120%±2	130	10
(302) X	222%±4	175	−47
Total	242%	205	−37
(303) X with Rheumatism	331%±13	235	−96

It is evident that the excess of mortality experienced over the company ratings was much higher in the combination than in the total mortality of the impairments.

The mortality ratios by duration and by age at issue for these classes did not show any distinct difference; there was however a suggestion that the mortality by ages at issue was somewhat higher in both at the younger ages.

The apparent effect of tonsillectomy on the mortality of the two classes is shown below, standard and substandard data having been combined and cases with hypertrophy excluded:

	Tonsillectomy Recorded	Without Tonsillectomy Recorded
Rheumatism alone	91%± 8	122%± 2
Rheumatism with murmur	325%±49	332%±13

(304) Apex murmur, systolic, inconstant.
X Found on examination.
XG Found on examination with slight hypertrophy.

		Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
X	Standard	12,063	43	54.72	79%± 8
	Substandard	9,803	59	43.01	137%±12
XG	Substandard	1,568	11	6.26	176%±35

The company ratings averaged 120% and 170% for X and XG, respectively.

The mortality ratio for cases with slight hypertrophy including the standard section in which there were no deaths, was 161%±32.

Among the cases without hypertrophy, the death rate from organic disease of the heart was twice the normal.

(305) Apex murmur, systolic, not clearly in (301 to 304).
(306) Mitral regurgitation not clearly in (301 to 305).
X Found on examination.
XG Found on examination with slight hypertrophy.
XH Found on examination with moderate hypertrophy.

		Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
X	Standard	2,924	17	13.63	125%±20
	Substandard	70,952	640	301.55	212%± 6
XG	Substandard	11,721	117	50.98	230%±14
XH	Substandard	4,702	72	20.46	352%±28

In the standard section of XG and XH there was very little exposure without any deaths.

The company ratings averaged 180%, 215% and 260% for X, XG and XH, respectively.

The death rates from organic disease of the heart, pneumonia and Bright's disease were 11, 2

and 2¼ times the normal, respectively. In a representative section of the data, there were 23 deaths from myocarditis, endocarditis and pericarditis against less than one expected death.

The mortality ratio was higher at the young ages than at the older ages and also decreased as the duration increased.

The average age at entry was 35, five years below the general average.

(307) Apex murmur, presystolic or diastolic, constant.
(308) Mitral obstruction, not clearly in (307).
X Found on examination.
XG Found on examination with slight hypertrophy.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
X Substandard	2,247	41	8.55	480% ± 48
XG Substandard	677	20	2.49	803% ± 120
Total	2,924	61	11.04	553% ± 50

In the standard section of X there were only three deaths. There was no material in the standard section of XG.

The company ratings, averaged 270% for X. Cases in XG were generally declined.

There were 21 deaths from organic disease of the heart against one death expected. In a representative section of the material, 18 deaths were from myocarditis, endocarditis and pericarditis against an expected death of less than one.

The average age at entry was 35, five years below the general average.

(309) Basic murmur, aortic area, systolic, constant, not transmitted.
X Found on examination.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
Substandard	5,708	35	26.70	131% ± 14

In the standard data there were only 3 deaths.

The company ratings averaged, according to the usual method, 200%; but it was observed that nearly all the material came from one company which had an average rating of 130%,—practically the same as in this study.

No cause of death was significant.

(310) Basic murmur, aortic area, systolic, constant, transmitted upward.
X Found on examination
X(G-H) Found on examination with slight or moderate hypertrophy.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
X Substandard	11,252	134	52.20	257% ± 15
X(G-H) Substandard	3,794	78	16.32	478% ± 38

There was no material in the standard section.

The company ratings averaged 220% for X and 245% for X with (G-H).

The death rate from organic disease of the heart was 12 times the normal. In a representative section of the material there were 36 deaths from myocarditis, endocarditis and pericarditis, and 8 deaths from embolism and thrombosis against an expected of less than one for all these five causes. It may be stated that the total number of deaths from all causes related to the heart was 50% of those from all diseases and accidents.

The age-group of highest mortality ratio was 40-49 in each section.

(314) Basic murmur, aortic area, diastolic, constant, transmitted downward.
(315) Aortic regurgitation, not clearly in (314).

X Found on examination.
XG Found on examination with slight hypertrophy.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
X Substandard	1,991	34	7.40	457% ± 50
XG Substandard	1,089	17	3.80	447% ± 72
Total	3,080	51	11.20	455% ± 41

In the standard section there was very little exposure and but one death.

The company ratings averaged 305% for X, while cases with XG were generally declined.

There were sixteen deaths from organic disease of the heart against an expected of less than one.

The mortality ratio decreased considerably after the first five policy years.

The average age at entry was 34, six years below the general average.

(316) Basic murmur, pulmonic area, systolic, constant, not transmitted.

X Found on examination.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
Standard	19,220	65	74.19	88% ± 7
Substandard	25,503	124	110.80	112% ± 7

The company ratings averaged 145%.

There was no significant cause of death in the standard section but in the substandard section the death rate from organic disease of the heart was 2½ times the normal and there were eight deaths from myocarditis, endocarditis and pericarditis against less than two expected.

The average age at entry was 34, six years below the general average.

This impairment covers murmurs which are probably functional in character, more so than (301), (304) and (309) which include a large proportion of functional murmurs. It is significant that in the substandard section of (316) the mortality ratios increase with age. Similar results were shown in 1920 by the Joint Committee in its report on functional heart murmurs and again in 1924 by Rogers and Hunter (T. A. S. A. Vol. XXV, p. 210).

(326) Hypertrophy of the heart, no murmur.

XG Slight hypertrophy, found on examination.
XH Moderate hypertrophy, found on examination.

As there was no substantial difference between the mortality, the classes with a slight or a moderate hypertrophy were combined.

This appears to be the first time that the mortality under this impairment has been investigated.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
XG, XH Standard	2,487	14	12.57	111% ± 20
Substandard	9,708	85	45.24	188% ± 13

The company ratings averaged 140% for XG and 185% for XH.

The death rate from accident was high.

Summary of Classes of Heart Murmur

There were ten classes dealing with heart murmurs, and these included all the numbers from (301) to (316), excepting (311) to (313), which were not investigated. In order to collect the material for purposes of comparison between the mortality experienced and the company ratings the following table of substandard data only has been prepared. It includes all degrees of hypertrophy, but this would not affect the validity of the comparison, as due weight was

given to these different types in preparing the average company rating. Those which are either purely functional (316) or which included functional murmurs in large proportion (301, 304, 309) have been listed separately.

Code No.	Type of Murmur	Actual Deaths	Substandard Data: Mortality Experienced	Substandard Data: Average Company Rating	Excess of Company Rating (Points)
(301)	Apex, systolic, constant, not transmitted	273	161% ± 6	155%	− 6
(304)	Apex, systolic, inconstant	70	142% ± 11	145	+ 3
(309)	Basic, aortic area, systolic, constant, not transmitted	35	131% ± 14	205	+ 74
(316)	Basic, pulmonic area, systolic, constant, not transmitted	124	112% ± 7	145	+ 33
		502	141% ± 4	155%	+ 14
(302)	Apex, systolic, constant, transmitted to left	1,821	240% ± 5	185%	− 55
(303)	Infection combined with impairment (302)	609	290% ± 9	240	− 50
(305, 306)	Apex, systolic, not in (301-304)	829	222% ± 4	190	− 32
(307, 308)	Mitral obstruction	61	553% ± 50	270	−283
(310)	Basic, aortic area, systolic, constant, transmitted upward	212	309% ± 15	220	− 89
(314, 315)	Aortic regurgitation	51	455% ± 41	330	−125
		3,583	250% ± 3	200%	− 50

It appears from the above table that among cases with organic heart murmurs the experience has been worse than was anticipated. Other statistics generally show that an increasing relative death rate from heart disease has been a feature of the last two decades. This is the first time that experience has been presented differentiated according to the characteristics found by the examiner rather than his opinion.

Under impairment (309) it was pointed out that nearly all the material came from one company which had an average rating of 130%,—practically the same as the experience. From the above table it might be inferred that impairment (316) is nearly always functional since the mortality even under rated cases was so favorable. The Joint Committee Investigation in 1920 dealing with functional heart murmurs showed a mortality ratio of 97% ± 6. In each of the three classes (304, 309, 316) the mortality was higher at the older ages. This tendency for functional murmurs had been pointed out in the investigation referred to. In the case of (301), which apparently had a smaller proportion of functional murmurs than the other three classes, the mortality ratio was greater at ages under 40. Impairment (312), which is generally agreed to be purely functional, was not included in the investigation.

In any investigation into the effect of heart murmurs on mortality, it is necessary to differentiate according to the site of the murmur, i.e. whether it is at the apex or at the base, and also according to the time at which the murmur occurs, i.e. whether it is systolic, diastolic or presystolic. The effect of hypertrophy should also be shown. It was noted, however, that the two groups, apex and basic murmurs, would include classes (304) and (316), respectively, both of which are made up of cases of functional murmurs and show standard mortality ratios when the standard data are not excluded. The inclusion or exclusion of (304), however, would have

little effect on the mortality ratio for apex murmurs on the whole as the data for this class would comprise about 3% of the total, whereas the data of (316) would account for 52% of the substandard material under basic murmurs. Class (316) has therefore been excluded throughout the following differentiation. From a study of the mortality experienced among cases of heart murmur, differentiated by site, it was observed that, in all cases, whether without or with hypertrophy, the basic murmurs were more serious than those at the apex. A further subdivision by time was then made, and it was noted that all systolic murmurs, whether at the base or at the apex had practically the same mortality ratio. A similar experience was shown among cases of diastolic or presystolic murmurs. All the data on systolic murmurs were therefore combined, and similarly all on presystolic or diastolic murmurs to form the following table, dealing with substandard data only.

Apex and Basic Murmurs—Substandard Data

	Systolic (301-306) and (309-310)			Presystolic or Diastolic (307-308) and (314-315)		
	Mortality Experienced	Average Company Rating	Excess Points	Mortality Experienced	Average Company Rating	Excess Points
Without hypertrophy.....	216%± 2	180%	− 36	470%±38	280%	−190
With slight hypertrophy.....	229%± 7	200%	− 29	588%±65	295%	−293
With moderate hypertrophy..	435%±17	245%	−190	.....	.....	.....
With slight or moderate hypertrophy.....	287%± 6	220%	− 67	588%±65	295%	−293
With or without hypertrophy.	232%± 2	190%	− 42	504%±30	285%	−219

It is evident from the above table that presystolic or diastolic murmurs, as has been the general opinion, are of a much more serious nature than systolic murmurs and that the provision made for an extra mortality should be increased for each type.

In both types of murmur, it is clearly shown that the presence of hypertrophy adds considerably to the risk,—to a much greater degree than had been expected. A study of the data for systolic murmurs shows that as the degree of hypertrophy increases the relative mortality increases more quickly than had been anticipated.

The effect of a history of infection on the mortality of cases with a heart murmur was dealt with under (303) where it was shown that cases with a history of rheumatism have a much higher relative mortality than cases with a history of another infection and that the effect of hypertrophy has been to cause a still higher death rate among the rheumatic cases than among the others.

A combination of the data of classes (301) to (306), excluding (303), gives an experience comparable with the findings of Rogers and Hunter in their investigations into the mortality experienced among cases with mitral regurgitation (T. A. S. A., Vol. XX, p. 83) and (Vol. XXV, p. 210). To facilitate comparison the following table is given, dealing with substandard data throughout:

	Actual Deaths	Mortality Experienced Substandard	Average Company Rating	Excess Points	R. and H. (1924)	R. and H. (1919)
Without hypertrophy...	2164	207%±2	170	−37	188%± 4	165%± 5
With hypertrophy.....	829	270%±5	210	−60	246%±10	205%±12
Difference.....		63			58	40

It may be seen that the relative mortality for cases with hypertrophy and for those without hypertrophy has shown an increase in each of the last two investigations over the experience of the preceding, a result in accordance with other contemporary statistics. It should be noted that the differences between the mortality ratio for cases without hypertrophy and those with hypertrophy are greater in the more recent experiences; this increase, however, appears some-

what more marked than is actually the case, as in the data furnished by Rogers and Hunter, cases with slight hypertrophy were grouped with those with no hypertrophy.

The following table summarizes the substandard experience under a combination of all the heart murmur classes in which slight hypertrophy was separated from moderate hypertrophy, (301, 302, 304-308, 314-315).

	Hypertrophy	Average Company Rating	Mortality Experienced Substandard	Excess of Company Rating
X	None	175%	211% ± 2	— 36 points
XG	Slight	205	238% ± 7	— 33 "
XH	Moderate	245	435% ± 17	—190 "

A study of the results of the investigation into mortality among the various types of heart murmurs and hypertrophy indicates the following:

1. The relative mortality among cases with heart murmurs is increasing.

2. The selection has been rather liberal in cases of moderate hypertrophy. This may be partly the result of the opinion held for many years that a murmur with hypertrophy was a better condition than the same type of murmur without hypertrophy. The error of this opinion was pointed out by Rogers and Hunter in 1919 (T. A. S. A., Vol. XX, p. 91). After allowance is made for the erroneous opinion mentioned, it still appears that the death rate increases to a disproportionate degree with an increase in extent of the hypertrophy.

3. The sum of the ratings for hypertrophy alone and for a murmur without hypertrophy is not sufficient to express the effect of the heart murmur with hypertrophy.

4. If all hypertrophies without heart murmur are considered, the experience is about 20 points higher than the company ratings.

5. There is sufficient material among the more common types of heart murmurs to enable the companies to rate the risks with reasonable confidence. In the less common types, especially in the most serious impairments, the companies have not been severe enough or on the other hand their high ratings have resulted in the better risks refusing to accept the policies. In this connection it may be mentioned that in the highly impaired risks where the mortality provision may be from 300% to 400%, the percentage of business delivered may be as low as 25% of the total applications received.

6. Cases of heart murmurs with a history of rheumatism show a much worse mortality than those with a history of another infection, and hypertrophy with the former cases is a much greater hazard than with the latter.

In a combination of all cases of heart murmur, the death rate from organic disease of the heart was 8 times the normal. The death rates from pneumonia, Bright's disease and influenza were 2¼, 2 and 1¼ times the normal, respectively. In a representative section of the material there were 398 deaths from myocarditis, endocarditis and pericarditis combined, against an expected of about eleven. The following causes of death, which owing to the paucity of data were not significant in the individual classes, now show significantly low rates—apoplexy, appendicitis and accident each at (¾) normal and warfare and tuberculosis other than pulmonary, each at (½) normal.

The mortality ratio was higher at the younger ages at issue than at the older ages.

Until the year 1925 heart murmurs were classified as mitral regurgitation, mitral obstruction, aortic obstruction and aortic regurgitation. The classification used in the present report was made possible by re-coding from the application files. It is noteworthy that the proportion with a specific designation was large in spite of this difficulty. It may be of interest to note that 91% of the murmurs were of the type formerly classed as mitral regurgitation (301-306), 6% aortic obstruction (309-310), while (311-313) of this group were not investigated, 2% mitral obstruction (307-308), 1% aortic regurgitation (314-315).

(330-339) Abnormal pulse.

Statistics from the records of three life insurance companies covering 30,000 lives resident in the United States and Canada have been prepared at the request of the Committee. They show an average pulse rate for men of 74.7 and for women 75.8, a difference of 1.1 per minute. In life insurance examinations the pulse rate is usually taken with the applicant seated.

(330) Persistent rapid pulse, 90-100.

X Found on examination.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
Standard	34,900	252	186.80	135% ± 5
Substandard	13,868	101	63.60	159% ± 11

The company ratings averaged 145%.

In the standard and substandard data combined, the death rates from influenza, tuberculosis of lungs, and cancer were 2¼, 2¼ and 1½ times the normal, respectively. Accidents were significantly low at (½) the normal.

The M. A. M. I. had a mortality of 169% ± 5.

The mortality ratio decreased as the duration advanced, and was higher at the young ages than at the older ages.

(331) Persistent rapid pulse, over 100.

X Found on examination.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
Standard	4,173	20	21.86	91% ± 14
Substandard	3,392	36	14.37	251% ± 28

The company ratings ranged from 165% to "risk not accepted."

In the substandard group, the death rates from influenza and tuberculosis of the lungs were respectively 7 and 5 times the normal.

The M. A. M. I. had a mortality of 205% ± 20.

The mortality ratio decreased as the duration advanced.

It is highly improbable that any company accepted risks on standard plans when the pulse was persistently above 100 per minute. This group doubtless represents cases in which there was an occasional reading of high pulse rate due to nervousness on examination.

(332) Persistent slow pulse, 55-65.

X Found on examination.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
Standard	347,131	1,463	1,802.60	81% ± 2
Substandard	19,629	89	86.25	103% ± 7

The company ratings averaged 105%.

Tuberculosis of the lungs, other forms of tuberculosis, cancer, cerebral hemorrhage, pneumonia and appendicitis were all significantly low at (¾) the normal. Diabetes, organic disease of heart, Bright's disease and suicide were all significantly low at (½) the normal.

In the substandard section the average age at entry was 35, five years below the general average.

The death rate from warfare was four times the expected (103 deaths). Investigation revealed that this was caused entirely by the contribution of two Canadian companies which gave 28% of the entrants, 37% of all deaths and 89% of the war deaths in this impairment. For all impairments their contribution was about 5% of the entrants. This code number (332)

was not recorded by several large American companies because it was their practice to grant a credit for this condition and such cases were not counted as "impairments."

A test was made to see whether the average height and weight were greater among those with slow pulse than among those with normal or with rapid pulse. Eight thousand cases were obtained in the two groups of abnormal pulse and divided into four sets of ages at issue, in each of which averages were formed. The result was not conclusive because of the possible influence of other factors, such as country of origin and occupation.

(333) Persistent slow pulse under 55.
X Found on examination.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
Standard and substandard	6,947	25	35.44	71%±9

The company ratings averaged 135%. The low mortality experienced may mean that the selection of risks was made from those without flaw and possibly with an inherited slow pulse and an excellent family history.

There were six deaths in the substandard group. Five of the deaths in the total data were due to organic disease of the heart.

(334) Persistent intermittent pulse—under 5 per minute.
(335) Persistent intermittent pulse—5 to 10 per minute.
(336) Persistent intermittent pulse—over 10 per minute.
X Found on examination.

		Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
(334)	Standard.....	9,292	69	57.83	119%±10
	Substandard..	7,957	49	48.69	101%±10
(335)	Standard.....	1,935	12	10.60	113%±21
	Substandard..	5,726	40	30.59	131%±14
(336)	Substandard..	3,471	27	17.96	150%±20
(334, 335, 336)	Standard.....	11,922	83	72.00	115%± 8
	Substandard..	17,154	116	97.24	119%± 7

The company ratings averaged 135%, 160% and 185% for (334), (335) and (336), respectively.

The death rate from organic disease of the heart was 2½ times the normal. The M. A. M. I. also showed that heart disease was markedly higher than normal for a combination of all cases of intermittent pulse.

(337) Irregular pulse, under 5 per minute.
(338) Irregular pulse, 5 to 10 per minute.
(339) Irregular pulse, over 10 per minute.
X Found on examination.

		Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
(337)	Standard.....	7,784	41	41.55	99%±10
	Substandard..	3,341	25	17.48	143%±19
(338)	Substandard..	2,336	29	12.33	235%±28
(339)	Substandard..	1,965	15	9.90	151%±26
(337, 338, 339)	Standard.....	9,058	43	47.62	90%± 9
	Substandard..	7,642	69	39.71	174%±14

There were no deaths in the standard section of (338) and only two in the same section of (339). Combining the standard and substandard data gave a mortality ratio of 172%±21 for (338) and 149%±24 for (339).

The company ratings averaged 135%, 160% and 185% for (337), (338) and (339), respectively. The M. A. M. I. showed a mortality ratio of 95%±6 for all cases of irregular pulse.

In a combination of the three classes of irregular pulse (337, 338, 339), the death rate from organic disease of the heart was 2¾ times the normal. In a representative section of the data there were 7 deaths from myocarditis, endocarditis and pericarditis against an expected of less than one.

The variation among the three classes (337, 338, 339) can be ascribed only to paucity of data.

Summary of Classes of Abnormal Pulse

It may be observed that cases with abnormal pulse have experienced a mortality more favorable than was anticipated,—the reverse of the experience with heart murmurs. Whereas the classes with rapid pulse have greatly improved since the M. A. M. I., those with intermittent or irregular pulse tend to show a greater death rate than formerly. This is to be partly explained by the fact that in the M. A. M. I. the intermittent pulse was not always persistent. It may be noted that the code under which the cases included in the present report were classified, specified persistent intermittent pulse, but the adjective persistent was not applied in the case of irregular pulse. The companies have generally made the same ratings for irregular as for intermittent pulse.

In the large class of slow pulse the experience was exceptionally good. It may be remembered that the Specialized Investigation (1903) revealed a mortality about 30% better than the standard among cases with a pulse rate less than 60 per minute. Although this excellent result was then a surprise, it is now confirmed.

(344) Arterial tension, abnormal.

During most of the period covered by this investigation it was customary to measure arterial tension by the systolic blood pressure. In recent years the diastolic pressure has also been observed and attention paid to the relationship between these two measures of tension.

The auscultatory method was used in taking the blood pressure. A description of methods is given in "The Medical Side of Field Work" by Dr. William Muhlberg.

X Found on Examination.

Ages	Average Systolic Blood Pressure	Over Average (X1)	High (Y1)	Highest (X2)
15-29	120 Mm.	125-135 Mm.	136-144 Mm.	145+ Mm.
30-44	125 "	130-140 "	141-149 "	150+ "
45-53	130 "	135-145 "	146-154 "	155+ "
54-70	135 "	140-150 "	151-159 "	160+ "

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
(X1) Substandard	34,555	371	241.90	153%±5
(Y1) Substandard	25,570	382	211.49	181%±6
(X2) Substandard	46,750	750	348.25	215%±4

The companies were asked to furnish only substandard data.

The company ratings averaged 105%, 130% and 165% for (X1), (Y1) and (X2), respectively. The company ratings quoted here are those now in effect and are generally lower than were in use at the time of the experience. This explains how the average could be 105% in the (X1) group although the data were substandard. A random sample of 200 cases showed an average company rating at issue of 135% in (X1). It may be noted that in each of the three subdivisions of this class the mortality experienced was about 50 points higher than the average of company ratings. This fact may be viewed in relation to the results already recorded under heart murmurs. With the exception of abnormal pulse the circulatory impairments in general seem to reflect the stress and strain of modern life more than any other portion of this report.

The death rate from cerebral hemorrhage was 3½ times the normal. From organic disease of the heart it was 2¾ times and from myocarditis, endocarditis and pericarditis combined, 11 times the normal (56 deaths). The death rates from cirrhosis of the liver and Bright's disease were each 2½ times the normal. The death rate from pneumonia was 1½ times the expected, but from tuberculosis of the lungs it was low—(¾) the normal. The death rate from cancer was 1¼ times the normal.

In representative sections of the material there were 40 deaths from arterio-sclerosis and 6 deaths from paralysis, 7 and 3 times the normal, respectively. Angina pectoris caused 43 deaths, 5½ times the normal. There were 22 deaths from embolism and thrombosis, and 5 from oedema of the lungs against an expected of less than one in each case.

The average age at entry was 47, seven years above the general average.

In view of the high mortality shown above, a test was made to see whether the proportion of overweights was greater among the lives with the greatest excess of blood pressure above normal. There was, however, no consistent tendency that way.

In view of the size of the present data it is now possible to give more detailed information than heretofore regarding the incidence of mortality in this impairment class. The following table shows the data by age at entry for the entire class—5 or more mm. above the average systolic blood pressure.

Ages	(1) Exposed to Risk	(2) Actual Deaths	(3) Expected Deaths	Ratio % (2)÷(3)
15-24	8,949	19	24.29	78%±12
25-29	9,606	35	27.21	129%±14
30-34	8,451	31	26.07	119%±14
35-39	12,648	120	50.73	237%±14
40-44	19,984	230	109.66	210%± 8
45-49	17,942	344	138.62	248%±10
50-54	15,597	332	173.67	191%± 8
55-59	9,754	274	161.81	169%± 7
60-64	3,524	101	77.19	131%± 9
65 and over	420	17	12.39	137%±22
All	106,875	1,503	801.64	187%± 4

From this table it may be observed that at entry ages below 35 there were only 25% of the exposed and 6% of the deaths with a mortality ratio of 110%±8. These deaths were evenly distributed over the different sections of excess blood pressure, and not chiefly at those of small excess. At entry ages 35-49 half of the data appeared with a mortality ratio of 232%±6. At ages 50 and over the relative mortality gradually decreased as the age advanced.

The following table shows the data for the entire class, 5 or more Mm. above the average systolic blood pressure, arranged by policy year:

Years	(1) Exposed to Risk	(2) Actual Deaths	(3) Expected Deaths	Ratio % (2) ÷ (3)
1	28,126	217	130.37	166% ± 8
2	20,894	210	137.08	153% ± 8
3	16,453	204	121.27	168% ± 8
4	12,361	183	99.12	185% ± 9
5	8,853	169	78.49	215% ± 11
6	6,452	141	65.39	216% ± 13
7	4,667	99	50.39	196% ± 14
8	3,493	84	40.17	209% ± 15
9	2,267	74	28.41	260% ± 21
10	1,385	54	19.08	283% ± 25
11	886	25	13.07	191% ± 25
12	512	22	8.39	262% ± 37
13 and later	526	21	10.41	202% ± 30
All	106,875	1,503	801.64	187% ± 4

The mortality ratio for the first five years was 174% ± 3, for the next five years 222% ± 7 and for the third five years, 217% ± 17. In many ways the experience in this class may be regarded as typical of underaverage business as a whole. Both by age and by duration the mortality ratios increase for some time and then tend to decline. The curve is different, but the general trend is similar.

As the material in the (X2) group was so extensive, the data of two of the contributing companies, comprising about 75% of the total, were divided into 3 groups—(a) 25-34 mm. above the average, (b) 35-44 mm. above the average and (c) 45 mm. and more above the average.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
(a)	25,830	412	201.13	205% ± 6
(b)	7,855	138	52.10	265% ± 16
(c)	1,141	34	8.85	384% ± 42
Total	34,826	584	262.08	223% ± 7

As was expected, the mortality ratios increased as the excess of arterial tension became greater.

The average age at entry for this group of 35,000 exposed was 45, five years above the general average.

In 1925 this Committee published a report on blood pressure, in which appeared the mortality in two groups of systolic blood pressure higher than the normal: (1) "over the average" 5 mm. to 15 mm. above the average, (2) "high blood pressure" more than 15 mm. above the average. The former showed a mortality of 131% and the latter a mortality of 143%. The mortality ratios for the "high" group in that investigation, modified to bring them into relationship with the standard experience (table 21), in that report are given below, with the corresponding mortality ratios in the present investigation:

Ages at Entry	+16 Mm. and more Joint Committee (1925)	+16 Mm. and more Present Investigation
15-39	183%±29	182%±9
40-49	274%±27	256%±8
50 and over	165%±20	178%±5
All	207%±14	202%±4

The two sets of ratios are in satisfactory agreement.

The average age at death from certain causes may be of interest in this class. For both arterio-sclerosis and angina pectoris it was 55 and for paralysis, 60.

(401, 402, 403) Pulmonary tuberculosis.

Companies rarely accepted cases when tuberculosis was active upon examination or with bacilli present. The physical signs referred to in (402) are those found upon current examination and may be of such character as the following: (a) small dry crackling sounds (rales), (b) old pleuritic friction sounds, (c) a diminished breathing area, or an area of bronchial breathing.

These impairments have been investigated separately regarding duration since the attack and then combined regarding the degree of underweight or overweight as compared with the average build for standard lives.

(401) Pulmonary tuberculosis, not specified as to physical signs or bacilli.

C One attack, within 3, 4, 5 years of application.
D One attack, within 6 to 10 years of application.
F One attack, over 10 years prior to application.

		Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
C	Substandard	2,331	19	9.14	208%±31
D	Substandard	5,828	40	25.58	156%±17
F	Standard	3,440	20	22.31	90%±14
	Substandard	3,236	14	17.45	80%±14

In the standard section there were 2 deaths in C and 3 in D.

The company ratings averaged 235%, 180% and 140% for C, D and F, respectively. For standard and substandard data combined the corresponding mortality ratios were 163%±24 for C, 127%±13 for D and 86%±9 for F. In the M. A. M. I. the data were too small to arrive at any conclusions.

The death rate from tuberculosis of the lungs was 4 times the normal.

The mortality ratio increased as the duration advanced and was higher at the young ages than at the older ages.

The generally low mortality and the comparatively small amount of material available suggest that there was a careful selection on the part of the companies.

(402) Pulmonary tuberculosis with physical signs or bacilli present.

C One attack, within 3, 4, 5 years of application.
D One attack, within 6-10 years of application.
F One attack, over 10 years prior to application.

		Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
C	Substandard	1,719	21	6.83	307%±46
D	Substandard	3,704	26	16.20	160%±21
F	Substandard	2,528	13	12.66	103%±19

In the standard sections of C, D and F combined there were only 11 deaths recorded.

The company ratings averaged 255%, 190% and 150% for C, D and F, respectively. These excluded cases with bacilli present on examination since such cases were rarely accepted. For the standard and substandard data combined the mortality experienced in C was 253%±38 and in D it was 135%±18.

The death rate from tuberculosis of the lungs was 4 times the normal. There were two deaths from other forms of tuberculosis and eight deaths from pneumonia, 3 times the normal proportion.

The mortality ratio was higher at the young ages than at the older ages. A detail table is given for the entire substandard section of this class, although the data are not homogeneous.

(403) Pulmonary tuberculosis without physical signs.

C One attack, within 3, 4, 5 years of application.
D-F One attack, over 5 years prior to application.

		Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
C	Substandard.....	1,818	15	6.67	225%±38
D-F	Standard.....	1,953	17	11.97	142%±23
	Substandard.....	4,733	24	20.71	116%±16

In the standard section of C only three deaths were recorded.

The company ratings averaged 225% and 155% for C and D-F, respectively.

The death rate from tuberculosis of the lungs was 5 times the normal and for other forms of tuberculosis there were 8 deaths against less than one expected

The mortality ratio was higher at the young ages than at the older ages.

(401-403) Pulmonary tuberculosis, with or without physical signs.

C-F One attack, more than 2 years prior to application.
(a) 10% or more underweight.
(b) 9% under to 9% overweight.
(c) 10% or more overweight.

		Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
(a)	Substandard.....	7,796	70	37.27	188%±15
(b)	Standard.....	6,431	32	39.20	82%±10
	Substandard.....	14,964	94	65.45	144%±10
(c)	Standard and Substandard...	5,364	17	24.40	70%±11
(a), (b), (c)	Standard.....	10,719	48	64.01	75%± 8
	Substandard.....	25,930	174	115.61	151%± 8

In the standard sections of groups (a) and (c) there were nine and seven deaths, respectively.

The company ratings averaged 215%, 195% and 180% for (a), (b) and (c), respectively.

The death rate from tuberculosis of the lungs was 4 times the normal. Other forms of tuberculosis had 13 deaths against less than three expected.

The mortality ratio increased in the early years of duration and was higher at the young ages than at the older ages at issue.

As had been anticipated, the mortality ratio was lower among those of average weight than among underweights, and lowest of all among overweights.

Summary of Classes of Tuberculosis

Reference to impairments (141) and (142) shows that under other forms of tuberculosis as well as for pulmonary tuberculosis the experience tended to be somewhat better than the company ratings. As had been pointed out in a paper based on the experience of the Equitable Life Assurance Society (Rockwell and Henderson) the reduction in mortality was less under the non-pulmonary forms than under pulmonary tuberculosis itself. This may be considered to be in harmony with the hypothesis which Dr. Archibald had brought forward, namely, that tuberculosis of bone or joint is merely a localized evidence of general infection. With this in mind it was coded under "general diseases." Upon the whole the experience tended to be high when the attack was within 3 to 5 years of application and low for later cases.

These results may be interpreted in the light of the great reduction in tubercular mortality during this century and the attention which has been focused upon this impairment in all civilized countries. The selection has most evidently been rigorous but aided by improved methods of cure.

In passing, attention may be drawn to the fact that the mortality was no lower among those reported without physical signs or bacilli present (403) than among the others (402). The company ratings made only a slight differentiation in this regard.

In a combination of all the data with a history of tuberculosis, the death rates from tuberculosis of the lungs, other tuberculosis and pneumonia were 3½, 7 and 1½ times the normal, respectively. The following causes of death which, owing to the paucity of data, did not show death rates significantly different from the normal in the individual impairments, show low rates in the combination of all the data,— appendicitis, diabetes and apoplexy, each at (¼) normal and accident at (½) normal. The mortality ratio was higher at the younger ages at issue than at the older ages,—in fact, all of the excess mortality occurred at ages under 40, the death rate at ages 40 and over having been normal.

Other respiratory impairments (413, 414, 416, 418) for which company ratings were available showed a similar tendency towards a lower mortality than was represented by the company ratings. Whereas the mortality experienced in the data subdivided by build as appears in the next few pages may be difficult to rationalize, yet the fact remains that upon the whole a lower death rate has occurred than had been anticipated in these respiratory impairments. This fact may serve to create more confidence than otherwise in the results presented under impairment (401).

In a combination of all the data for respiratory impairments other than tuberculosis of the lungs, the death rates from pneumonia, tuberculosis of the lungs, other tuberculosis, organic disease of the heart and influenza were 2½, 2¼, 2, 1¾ and 1½ times the normal, respectively. Accidents, cancer and suicide all showed death rates lower than normal, the ratios of the deaths from these causes to the expected being (¾), (½) and (½), respectively. The relative mortality was higher at the younger ages of issue than at the older ages.

(411) Lungs unsatisfactory (dullness, prolonged expiration, suspicious apices).

It was planned to investigate this impairment first with regard to the degree of underweight or overweight as compared with the average build for standard lives and then regarding place or residence, but the data were very few.

X Found on examination.
(a) 10% or more underweight.
(b) 9% under to 9% overweight.
(c) 10% or more overweight.
(X1) Eight mountain states (03, 07, 15, 32, 34, 37, 51, 57)†
(Y1) Sea coast and gulf counties (00, 04, 11, 13, 21, 28, 29, 49)†
(X2) Elsewhere.

		Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
(a)	Substandard.....	2,259	25	13.15	190%±25
(b)	Substandard.....	3,434	32	16.96	189%±23
(a), (b), (c)	Substandard.....	6,582	64	35.35	181%±14
(X2)	Substandard.....	5,995	59	32.60	181%±16

In the standard sections of groups (a) and (b) there were only 1 and 6 deaths, respectively; in group (c) there were 7 deaths, all in the substandard section. In groups (X1) and (Y1) there were 4 deaths and 1 death, respectively, all among the substandard data, and in the standard section of (X2) there were only 7 deaths.

As the symptoms of the impairment are varied and differ considerably in the degree of severity, the companies generally had no definite ratings, but treated each case on its merits.

The death rates from tuberculosis of the lungs and pneumonia were 7½ and 4 times the normal, respectively.

(413) Asthma, not hay fever, moderate or not specified.
(414) Asthma, not hay fever, severe.
X-C Found on examination or one attack within 5 years of application.
G-H Two or more attacks, last within 5 years of application.

		Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
X-C	Standard.....	12,344	84	67.99	124%± 9
	Substandard.....	3,842	42	19.21	219%±22
G-H	Standard.....	23,239	128	120.99	106%± 6
	Substandard.....	16,453	196	83.09	236%±12
X-C, G-H	Standard.....	35,583	212	188.98	112%± 6
	Substandard.....	20,295	238	102.30	233%± 9

The company ratings averaged 140% and 175% for X-C and G-H, respectively.

The M. A. M. I. showed a mortality ratio of 121%±5 for all the cases in the class.

In classes X-C and G-H, the death rates from organic disease of the heart were 3¼ and 2½ times the normal, respectively. In class G-H, the death rates from tuberculosis of the lungs, influenza and pneumonia were 1¾, 2¼ and 3½ times the normal, respectively. There were only 24 deaths from accident which was two-thirds of the expected number. In the M. A. M. I. a combination of all cases of asthma showed a death rate from pneumonia slightly higher than normal, while the death rate from tuberculosis was practically normal. The fact that in both time-groups of the new data heart disease was a significant cause of death suggests that cases of undetected cardiac asthma were included in the data. In a representative section of the material there were 16 deaths from asthma and pulmonary emphysema against less than one expected death.

Out of 186 deaths in a sample of the data five-sixths were in class (413), the balance being evenly divided between severe asthma (414) and hay fever (431). Of the 100 deaths in class

†The mountain states are: Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah and Wyoming.
The sea coast and gulf counties are in the following states: Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi and Texas. (See 1925 Residence Code for names of counties.)

(413) two-thirds were specified as moderate and the balance were not specified as to severity, although known to be asthma. In one large company provision was made that if "hay fever" was considered sufficiently serious to make the case substandard, then it should be classed as asthma.

(416) Hemorrhage of lungs.

B-F One attack, at any time prior to application.
(a) 10% or more underweight.
(b) 9% under to 9% overweight.
(c) 10% or more overweight.

		Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
(a), (b)	Standard.....	8,137	51	71.49	71%± 6
	Substandard.....	2,874	26	16.04	162%±21
(c)	Standard.....	1,585	19	14.36	132%±20

On account of the paucity of data and of the slight difference in mortality ratios, (a) and (b) were combined.

In the substandard section of (c) there were only four deaths recorded.

The company ratings averaged 195%, 165% and 140% for (a), (b) and (c), respectively. For the standard and substandard data combined the mortality experienced in (c) was 140%±20.

The death rate from tuberculosis of the lungs (8 deaths) was 2½ times the normal. There were six deaths from pneumonia. The average age at entry was 37.

The most probable interpretation of the results in this class is to be found in the selection exercised. It has apparently been careful at all degrees of build but somewhat more lenient among the overweights.

It is evident that the cases accepted in the "standard" group must consist of those in which the attack had occurred many years prior to application and in many of which the origin of the hemorrhage was doubtful. It does not seem advisable to give detail tables of the data on account of the small numbers in the groups and, when combined, on account of their lack of homogeneity.

This appears to be the first time that the mortality under this impairment has been investigated.

(418) Bronchitis, chronic.

X-F Found on examination or one attack at any time prior to application.
(a) 10% or more underweight.
(b) 9% under to 9% overweight.
(c) 10% or more overweight.

		Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
(a)	Substandard.....	1,101	21	6.56	320%±48
(b)	Substandard.....	4,324	33	25.29	130%±16
(c)	Substandard.....	1,645	18	8.61	209%±33
(a), (b), (c)	Standard.....	8,532	44	43.52	101%±10
	Substandard.....	7,070	72	40.46	178%±14

As there was little difference in the mortality in the standard sections of (a), (b) and (c) they were combined, especially in view of the lack of material.

The company ratings averaged 190%, 170% and 165% for (a), (b) and (c), respectively. In this, as in all other classes, the company ratings referred to the standard and substandard data combined.

The death rate from pneumonia was 2½ times the normal. There were 12 deaths from tuberculosis of the lungs, 1¾ times the normal proportion; of these, three were in (a), eight in (b) and one in (c).

In representative sections of the material there were eight deaths from myocarditis, endocarditis and pericarditis and four deaths from chronic bronchitis against an expected of less than one in each case.

The low mortality in the average weight group is a little hard to explain.

This appears to be the first time that the mortality under this impairment has been investigated.

(425) Pleurisy, no details.

B-C One attack, within 5 years of application.
D One attack, within 6-10 years of application.
(X1) Attack of less than 2 weeks.
(Y1) Attack of 2 weeks or more.

The duration of attack referred to usually means time spent in bed rather than time away from work, which will frequently be much longer. The facts as to duration of attack in a random sample from one company have been tabulated. The average duration of those less than two weeks was 4⅔ days, and of those two weeks or more, six weeks.

		Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
B-C(X1)	Standard.....	20,091	116	98.71	118%± 7
	Substandard....	3,632	26	13.10	198%±26
B-C(Y1)	Standard.....	15,336	108	71.73	151%± 9
	Substandard....	7,903	67	28.98	231%±18
D(X1)	Standard.....	11,665	67	63.36	106%± 8
D(Y1)	Standard.....	11,558	70	53.57	131%±10
	Substandard....	2,086	21	7.85	268%±40
B-C, D(X1)	Standard.....	31,756	183	162.07	113%± 6
	Substandard....	4,363	27	16.62	162%±21
B-C, D(Y1)	Standard.....	26,894	178	125.30	142%± 7
	Substandard....	9,989	88	36.83	239%±17

In the substandard section of D(X1) there was only one death.

For (X1) and (Y1) combined, the mortality ratio was 149%±6 for B-C and 124%±6 for D.

The company ratings averaged 160% and 135% for B-C and D, respectively. For pleurisy other than purulent the M. A. M. I. showed a mortality ratio of 146%±4 for B-C and 113%±5 for D.

The death rate from tuberculosis of the lungs was 3½ times the normal and from other forms of tuberculosis, 5 times the normal. The death rates from influenza and pneumonia were 1¾ and 1½ times the normal, respectively.

The mortality was high in the first five policy years and at ages under 40. A similar result was found in the M. A. M. I.

In the substandard section the average age at entry was 34, six years below the general average.

(426) Pleurisy, dry.

B-D One attack, within 10 years of application.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
Standard	43,045	274	192.94	142% ± 6
Substandard	7,039	44	27.90	158% ± 16

The company ratings averaged 155%.

The death rates from tuberculosis of the lungs and pneumonia were 3 times and twice the normal, respectively.

The mortality ratio decreased as the duration advanced and was higher at the young ages than at the older ages.

(427) Pleurisy, with effusion.

B-C One attack, within 5 years of application.
D One attack, within 6-10 years of application.

		Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
B-C	Standard	6,104	55	26.46	208% ± 19
	Substandard	6,079	54	21.93	246% ± 22
D	Standard	7,123	24	30.19	79% ± 11
	Substandard	2,009	11	7.55	146% ± 29
B-C, D	Standard	13,227	79	56.65	139% ± 10
	Substandard	8,088	65	29.48	220% ± 18

The company ratings averaged 190% and 135% for B-C and D, respectively.

The death rate from tuberculosis of the lungs was 6 times the normal. There were nine deaths from suicide, three times the normal.

The average age at entry was 34, six years below the general average.

In 1920 Toulmin and Perrin (T. A. S. A. XXI, p. 151) investigated cases with a history of pleurisy with effusion and obtained a mortality in ratio to the M. A. table of 163% in group B-C and 88% in group D-F. If allowance were made for the improvement in the company's standard mortality these ratios would probably not differ greatly from those now brought forward. The death rate from tuberculosis was found to be considerably above normal.

(428) Pleurisy, purulent.

B-C One attack, within 5 years of application.
D One attack, within 6-10 years of application.

		Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
B-C	Standard	9,202	39	39.48	99% ± 11
	Substandard	6,841	33	25.09	132% ± 16
D	Standard	10,995	44	48.01	92% ± 9
	Substandard	2,546	19	9.59	198% ± 30
B-C, D	Standard	20,197	83	87.49	95% ± 7
	Substandard	9,387	52	34.68	150% ± 14

Of the deaths in the substandard section of the B-C group, one-third were in B and two-thirds in C.

The company ratings averaged 135% and 110% for B-C and D, respectively.

In the M. A. M. I. a group comparable with B-C had a mortality ratio of 158%±30, and a group comparable with D, a mortality ratio of 104%±19. In a combination of all cases of purulent pleurisy, the M. A. M. I. showed a mortality ratio of 124%±16.

The death rate from tuberculosis of the lungs was twice the normal. In the M. A. M. I. 35% of the deaths were from tuberculosis of the lungs and in the present investigation 22% were from this cause.

In the substandard section the average age at entry was 34, six years below the general average.

Summary of Classes of Pleurisy

It is evident that the mortality experienced did not differ to any great extent from the average of the company ratings but confirmed the general belief that pleurisy with effusion is the most serious and purulent pleurisy the least so of the three types.

Cases known definitely to be of the purulent type did not experience a heavier mortality than was shown in the M. A. M. I., while in other cases it was significantly higher.

Under impairment (425) it was shown that the duration of attack was of considerable significance. A large volume of data indicated that when the attack of pleurisy lasted for an average of 5 days, the mortality was 46 points (28%) better than when the attack lasted for an average period of six weeks.

In a combination of all the data dealing with pleurisy the death rates from tuberculosis of the lungs and from other forms of tuberculosis were each 3½ times normal. The death rates from appendicitis, influenza and pneumonia were 2, 1½ and 1½ times the normal, respectively. The death rates from typhoid, cancer and cerebral hemorrhage were all somewhat lower than the average.

The mortality was higher at the younger ages at entry than at the older ages and also decreased as the duration advanced.

(502) Dyspepsia or indigestion.
(504) Gastritis.
B-D One attack within 10 years of application.
G-J Two or more attacks, last within 10 years of application.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
B-D Substandard.....	7,108	55	41.09	134%±12
G-J Substandard.....	9,972	77	59.27	130%±10
Total.....	17,080	132	100.36	132%± 8

Only "substandard" data were asked for in these impairments.

The company ratings averaged 160% and 170% for B-D and G-J respectively.

No cause of death was significant. Tuberculosis of the lungs caused eight deaths mainly among the younger group of entrants. Miscellaneous diseases of the stomach caused six deaths.

In the entire group, the mortality ratios decreased as the duration advanced.

Standard data for this class were included in the Specialized Investigation (1903) and found to have a favorable mortality in all cases except among the very old ages and the young underweights.

A study was made of about half of the data to determine the distribution by build in relation to the average. As none of the cases was substandard on account of build, there was a large proportion of underweights. This was due, at least in part, to the fact that the ratings for overweight

are in general greater than for underweight. However, among underweights the proportion of deaths was larger than the proportion of entrants (67% against 58%). In spite of these facts the mortality as a whole was considerably below the company ratings.

Dyspepsia, indigestion and gastritis are considered important only as symptoms of other impairments such as tuberculosis or ulcer of the stomach in young persons, liver trouble or weak heart in older people. The mortality experienced is largely affected by the care in selection.

(506) Gastric ulcer, without operation.

C One attack, within 3, 4, 5 years of application.
D One attack, within 6-10 years of application.
G-J Two or more attacks, last within 10 years of application.

		Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
C, D, G-J	Standard.....	3,716	20	19.82	101%±15
	Substandard.....	6,318	58	33.83	171%±15

The data did not justify a division into C and D, and there were only 8 deaths in group G-J.

The company ratings for C, D, G-J averaged 185%, 115% and 160%, respectively.

In the M. A. M. I. the data were too scanty to arrive at any conclusions.

As cancer is thought sometimes to be a sequel to gastric ulcer, it may be mentioned that in the standard and substandard sections combined there were only three deaths from that cause, but as will be later shown a larger proportion among the cases operated upon. In a representative section of the substandard material there were 10 deaths from ulcer of the stomach against an expected of less than one.

For a comparison between gastric and duodenal ulcer, see page 55.

(507) Gastric ulcer, with operation.

C One attack, within 3, 4, 5 years of application.
D One attack, within 6-10 years of application.
G-J Two or more attacks, last within 10 years of application.

		Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
C	Substandard.....	6,209	66	32.29	204%±16
D	Standard.....	2,809	17	15.78	108%±17
	Substandard.....	2,321	22	12.75	173%±24
C, D, G-J	Substandard.....	8,883	97	47.04	206%±14

In the standard section of C there were only 3 deaths.

In G-J there were no deaths in the standard section, while in the substandard section 9 deaths were recorded, with a high mortality ratio.

The company ratings for C, D, G-J averaged 185%, 115% and 160%, respectively. For the standard and substandard data combined the mortality ratio was 176%±14 in C.

In the M. A. M. I. the data were too scanty to arrive at any conclusions.

In the substandard group the death rate from cancer was 4 times the normal (17 deaths) while in the standard group there were only three deaths from this cause—too few to be significant. The death rate from appendicitis under cases with a history of gastric ulcer, with

or without operation, was lower than the normal. In fact, among the 97 substandard cases in class (507) there were no deaths from appendicitis. In a representative section of the substandard material there were 7 deaths from ulcer of the stomach against an expected of less than one.

For standard and substandard combined there was a marked decrease in the mortality ratio with advance in age.

The relatively low mortality on cases issued standard, whether with or without operation, indicates that the selection by the companies was effective. The present experience also shows that the ratings of the companies for gastric ulcer are justified upon the whole as the mortality under non-operated cases was below the ratings and it was only slightly higher where there had been an operation. The higher mortality in the latter and the number of deaths from cancer indicate a more seriously impaired type of risk after operation than among the others.

A comparison between gastric and duodenal ulcer is made after discussing impairment (547) —page 55.

(520) Biliary colic, not clearly coded elsewhere.
(521) Gallstones, no operation.
(526) Infected gall bladder, no operation.
B One attack, within 2 years of application.
C One attack, within 3, 4, 5 years of application.
D One attack, within 6-10 years of application.
G-J Two or more attacks, last within 10 years of application.

		Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
B	Standard.....	3,226	26	21.65	120%±16
C	Standard.....	5,327	57	47.55	120%±11
B C	Substandard.....	4,800	24	28.95	83%±12
D	Standard.....	5,701	47	49.52	95%±10
G-J	Standard.....	2,683	30	25.31	119%±14
	Substandard.....	2,158	17	13.37	127%±20
B, C, D, G-J	Standard.....	16,937	160	144.03	111%± 6
	Substandard....	7,518	48	46.55	103%±10

In the substandard section of D only seven deaths were recorded.

The company ratings averaged 150%, 125% and 110% for B, C and D, respectively, and 175% for G-J.

For a comparable group in the M. A. M. I. the mortality ratios were 130%±11 and 132%±12 for B-C and D, respectively, and 195%±18 for G-K, two attacks at any time prior to application.

Class (520) may include cases of "bilious colic" which may be merely severe indigestion. This would largely account for the difference between the mortality ratios and the company ratings.

The lower mortality in the substandard than in the standard group suggested looking for an underlying cause. An analysis showed that one company which does not issue policies on substandard plans, contributed one-half the material, which may have some bearing on the results.

The death rate from cerebral hemorrhage was twice the normal. No other cause of death was significant but there were 15 deaths from Bright's disease, slightly above normal, a condition which was also noted in the M. A. M. I. The death rates from heart disease and cancer were normal.

(522) Gallstones, removal of gall bladder.
(524) Infected gall bladder removed, no stones.
B Within 2 years of application.
C Within 3, 4, 5 years of application.
D Within 6-10 years of application.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
B, C, D Standard.....	13,948	88	89.43	98%± 7
Substandard.....	3,960	28	23.08	121%±16

The material when subdivided into B, C and D was so small that accidental fluctuations were certain to, and did occur. The combination gave a common-sense view of the situation.

The company ratings averaged 205%, 115% and 105% for B, C and D, respectively.

No cause of death was significant.

The average age at entry was 45, five years above the general average.

(523) Gallstones, drainage of gall badder.
(525) Infected gall bladder, no stones, drainage.
B-D One attack, within 10 years of application.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
Standard.....	15,639	161	118.91	135%± 7
Substandard.....	5,761	48	32.60	147%±15

The company ratings averaged 130%.

The death rate from Bright's disease was twice the normal.

The mortality ratio was higher at the young ages than at the older ages and also decreased as the duration advanced.

The average age at entry was 45, five years above the general average.

Summary of Classes of Biliary Colic

The mortality among cases treated either by medicine or by removal was approximately normal and was lighter than had been anticipated. Among cases where drainage was recorded, the mortality was practically the same as had been expected. Reference to the detail table will show that the extra mortality under drainage cases (523, 525) accepted as standard risks was chiefly experienced in the first two policy years.

Both operated and non-operated cases experienced a mortality lower than the company ratings, the difference having been greater for those without operation. Cases with two or more attacks were studied in the present investigation for only the non-operated or not specified section. The mortality experienced (122%±12) was considerably below both the company ratings and the M. A. M. I. The material in the M. A. M. I. comprised cases of gallstones or biliary colic, but was not divided according to the method of treatment so that no group was common to both investigations.

In the entire group of the M. A. M. I. the death rates from Bright's disease and organic disease of the heart were found to be distinctly higher than the normal. Among all cases of the present investigation (520-526) the death rate from heart disease was normal, while nephritis and Bright's disease showed a mortality only slightly above normal.

This group of impairments is well known to be more frequent among women than among men. Tests made among 1,350 entrants showed 40% women, much greater than the normal proportion (10% to 15%) among lives insured in the "ordinary" companies. The Statistical Bulletin of the Metropolitan Life Insurance Company for September 1930 showed that among the industrial policyholders as a whole the death rate (ratio of deaths to exposed) from gallstones was for women from 6 times at the young ages to 3 times at the older ages that of men; in the last decade, compared with that preceding, there had been no marked change for better or worse in the recorded mortality figures. It should be noted that this comparison for men and women includes

in one figure, both the frequency of biliary colic or gallstones and the resulting mortality among those who have the impairment.

In a combination of all the data for biliary colic, the death rates from apoplexy and cirrhosis of the liver were 1½ and 3½ times the normal, respectively. Deaths from tuberculosis of the lungs, diabetes, typhoid and appendicitis were all low, the first two each at (½) normal and the last two each at (¼) normal.

The mortality was higher during the earlier policy years than in the later years.

(536, 537) Fistula in ano.

These impairments have been investigated separately regarding duration since the attack and then combined regarding the degree of underweight or overweight as compared with the average build for standard lives.

(536) Fistula in ano, without operation.
X-D On examination or within 10 years of application.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
Standard	7,230	48	44.83	105%±11
Substandard	1,364	14	6.99	200%±36

The company ratings averaged 230% for X and 115% for B-D.

In the M. A. M. I. a combination of all cases with or without operation shows a mortality ratio of 119%±4. The details of the M. A. M. I. report are referred to under (537) where the bulk of the data appears.

No cause of death was significant.

(537) Fistula in ano, with operation.
B-D Within 10 years of application.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
Standard	51,125	340	315.73	108%± 4
Substandard	4,429	36	22.40	161%±18

The company ratings averaged 115%. As already stated, in the M. A. M. I. a combination of all cases with or without operation showed a mortality ratio of 119%±4.

In both standard and substandard groups, the death rates at the young ages from tuberculosis of the lungs and Bright's disease were 1½ and 1¾ times the normal, respectively. For all ages the death rates for diabetes, cerebral hemorrhage and appendicitis were 2½, 1½ and 2½ times the normal, respectively. For (536) and (537) combined, the M. A. M. I. showed death rates from tuberculosis of the lungs, cancer and Bright's disease several times the normal.

The mortality ratios were higher at the younger than at the older age groups.

No material difference in mortality between "operated" and "not operated" cases was shown.

(536, 537) Fistula in ano, with or without operation.
X-D On examination or within 10 years of application.
(a) 20% or more underweight.
(b) 19% under to 19% overweight.
(c) 20% or more overweight.

		Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
(b)	Standard	59,215	390	380.42	103%± 3
	Substandard	4,613	39	22.63	172%±19
(c)	Standard	7,740	89	47.58	187%±13
	Substandard	1,603	13	8.43	154%±28

There were only 10 deaths in (a) for standard and substandard combined, the mortality being approximately normal.

The company ratings averaged 250%, 230% and 215% for X and 140%, 115% and 105%

for B-D in the respective weight groups, 20% or more underweight, 19% under to 19% overweight, 20% or more overweight. In the M. A. M. I. the mortality ratio for those 25% or more overweight was 134%±15, for those 15% or more underweight, 134%±14.

Unfortunately our statistics do not differentiate between the severity of the fistula or the period over which it has existed. The foregoing results should therefore be considered with this in mind.

Among the light weights the data were too scanty to arrive at any conclusions. From the M. A. M. I. which showed a high mortality ratio for underweights of this class, though the extra mortality among underweights generally was not large, it was inferred that fistula among underweights was important especially as tubercular disease caused a greater number of deaths than normal. On the other hand overweights with fistula had a mortality ratio little in excess of overweights generally, from which it was concluded that the fistula had little effect in this group.

In the group comprising those of normal weights, the deaths from tuberculosis of the lungs were 1½ times the normal at the young ages. The deaths from Bright's disease were high at the younger ages but distinctly low at the older ages at entry. Cerebral hemorrhage at 1¾ times the normal was significant for all ages. In each of the age groups and also for all ages appendicitis was significant, the number of deaths being twice the normal for all ages. Among overweights the death rate from Bright's disease was twice the normal.

It is possible that the mortality ratios for the build groups are largely due to the selection which would naturally follow the publication of the results in the M. A. M. I.

(546) Duodenal ulcer, without operation.

B One attack, within 2 years of application.
C One attack, within 3, 4, 5 years of application.
D One attack, within 6-10 years of application.
G-J Two or more attacks, last within 10 years of application.

		Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
B	Substandard.....	1,911	22	9.01	244%±34
C	Substandard.....	2,718	12	13.09	92%±17
B, C, D, G-J	Standard.....	1,903	12	10.42	115%±22
	Substandard....	5,349	43	25.48	169%±17

In the standard sections of B and C there were only 1 and 8 deaths, respectively; in group D, only 3 deaths in the standard and 4 in the substandard section. In G-J no deaths were recorded in the standard and 5 in the substandard section.

The company ratings for B, C, D, G-J averaged 215%, 135%, 110% and 145%, respectively. For the standard and substandard data combined the mortality experienced was 219%±31 in B, 122%±18 in C and 105%±26 in D.

In the M. A. M. I. the data were too scanty to arrive at any conclusions.

In the substandard group there were four deaths from cancer.

(547) Duodenal ulcer, with operation.

B One attack, within 2 years of application.
C One attack, within 3, 4, 5 years of application.
D One attack, within 6-10 years of application.
G-J Two or more attacks, last within 10 years of application.

		Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
B	Substandard.....	2,264	22	11.00	200%±28
C	Standard.....	2,011	16	11.47	139%±24
	Substandard.....	2,366	19	13.80	138%±21
D	Standard.....	2,154	17	13.53	126%±20
B, C, D, G-J	Standard.....	4,480	33	26.69	124%±15
	Substandard....	5,573	51	30.90	165%±15

In the standard section of B no deaths were recorded; in the substandard section of D, there were 9 deaths and in the standard and substandard sections combined of G-J there was 1 death.

The company ratings for B, C, D and G-J averaged 215%, 135%, 110% and 145%, respectively.

In the M. A. M. I. the data were too small to arrive at any conclusions.

Combining (546) and (547), cases with and without operation, the mortality among applicants accepted on standard plans was 121% ± 12 (45 deaths). There was no material difference between the mortality from duodenal ulcer with and without operation among cases accepted substandard. The combined substandard mortality, 167%, was lower than for the corresponding cases of gastric ulcer, 192%.

Comparison Between Gastric and Duodenal Ulcers

It is evident that the experience among cases of gastric ulcer, whether operated on or not, when the attack took place within 3 to 5 years prior to application, is lighter than had been anticipated and that operated cases for both types of ulcer show a heavier mortality than had been expected when the attack had taken place within 6 to 10 years prior to application.

In interpreting the results of an investigation into the mortality of cases with a record of either a gastric or a duodenal ulcer, it must be borne in mind that until recent years the diagnoses have been frequently at fault. In March 1928, Dr. E. L. Judd of the Mayo Clinic stated "until recently it was not known that many of the ulcers called gastric were in the duodenum." The United States Mortality Statistics show that the ratio of the number of deaths diagnosed as due to stomach ulcers to the number due to duodenal ulcers fell from 3.1 in 1921 to 2.3 in 1928.

One of the few reports on the mortality among cases with these ulcers diagnosed reliably was shown in the proceedings of the Life Insurance Medical Directors' Association (Vol. V, page 326, 1919), the data of which comprised cases operated on at the Mayo Clinic. In that report the death rate from gastric ulcer was shown as twice that from duodenal ulcer, which was practically standard. While the data were not numerous, the indications were that the mortality under gastric ulcer was at least twice the normal for a number of years after the operation. This result is confirmed by the U. S. Mortality Statistics mentioned above and also by the report of the Registrar-General of England and Wales in 1927, which showed the following death rates per 100,000 of the population.

Ulcer	Men	Women	All
Stomach	10.2	4.2	7.0
Duodenal	5.6	.7	3.1

The results in the present investigation show a considerable difference from those mentioned above. It is probable that the new data for gastric ulcer contained many cases which were really duodenal, the more common word "stomach" having been used rather than the correct but uncommon word "duodenum." One of the difficulties which the companies are facing is that when they treat a history of duodenal ulcer more liberally than that of gastric ulcer, there is a natural tendency to state that the former was the trouble and not the latter. Where there has been an operation, the companies are generally asking for a statement from the surgeon, and where there has been no operation, some proof such as an X-ray is required.

In their Statistical Bulletin for June 1931 the Metropolitan Life Insurance Company gave

tables of the death rate from gastric and duodenal ulcers for the period of years 1921 to 1930 divided into male and female, white and colored. The following synopsis is given:

Ulcers of the Stomach and Duodenum
Death rate from 1921-1930, inclusive

Age Groups	White Males	White Females
15-19	.8	.5
20-24	2.5	1.0
25-34	6.7	1.8
35-44	16.0	3.1
45-54	23.9	5.7
55-64	25.5	8.2
65-74	27.3	11.9

The death rate among men was about two and one-half times that among women.

Comparing the periods 1921-1923 with 1927-1930, the average death loss had increased 38.5% for men and had declined 8.3% for women. No attempt was made to explain these different results in the two sexes.

In a combination of all the data dealing with gastric or duodenal ulcers in the present report, the death rate from cancer was 1¾ times the normal. Death rates from accident, influenza, diabetes and apoplexy were all relatively low at (¾), (½), (¼) and (¼) normal, respectively.

(601-609) Albuminuria.

The standards of quantitative measurement and the definitions suggested by a Committee of the Association of Life Insurance Medical Directors are as follows:

	Proportion of Albumin	
10—50 Mgs.	.01 %— .05%	Faint trace, trace
51—100 "	.051%—0.1%	Moderate
Over 100 "	over 0.1%	Large

"Accidental," if found in one of several tests.

"Intermittent," if found in two out of three or four tests.

"Constant" (or "Persistent"), if found in two out of two, three out of three, or three out of four tests, and when more than a trace, if found in two out of three tests.

(603) Albumin, intermittent, trace.

X Found on examination.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
Standard	13,697	65	65.92	99% ± 8
Substandard	34,992	194	150.65	129% ± 6

The company ratings averaged 120%.

The death rate from suicide with 21 deaths was 2¾ times the normal.

In the substandard section the death rates from tuberculosis of the lungs, pneumonia and Bright's disease were 1¾, 2 and 2½ times the normal, respectively. The death rate from myo-

carditis, angina pectoris, endocarditis and pericarditis (15 deaths in a representative section of the material) was much higher than the normal.

In the substandard section the average age at entry was 35, five years below the general average.

(604) Albumin, intermittent, moderate.
(605) Albumin, intermittent, large amount.
X Found on examination.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
(604) Substandard.....	6,563	39	25.92	150% ± 17
(605) Substandard.....	1,402	14	4.56	307% ± 55

In the standard section 3 deaths were recorded for each of these impairments.

The company ratings averaged 145% and 200% for (604) and (605) respectively. The mortality ratio for standard and substandard combined was 137% ± 14 for (604) and 333% ± 53 for (605).

In (604) there were ten deaths from Bright's disease against less than two expected and in (605), four deaths from Bright's disease against less than one expected.

The average age at entry was 34, six years below the general average.

(607) Albumin, constant, trace.
X Found on examination.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
Standard.....	17,461	81	79.19	102% ± 7
Substandard.....	69,929	492	283.86	173% ± 5

The company ratings averaged 130%.

The death rate from Bright's disease was 5½ times the normal. The death rates from tuberculosis of the lungs, organic disease of the heart and pneumonia were each 1½ times and from cancer 1¾ the normal.

Among the substandard cases the death rate from cerebral hemorrhage was 2¼ times the normal, while in a representative section of the material the deaths from myocarditis, endocarditis, angina pectoris and pericarditis were 33 against an expected of about five.

(608) Albumin, constant, moderate.
X Found on examination.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
Standard.....	4,170	18	13.21	136% ± 22
Substandard.....	30,283	200	115.25	174% ± 9

The company ratings averaged 175%.

Among the substandard cases the death rate from Bright's disease was 7½ times the normal. In a representative section of the substandard cases, myocarditis, endocarditis and pericarditis combined caused six deaths against less than one expected.

The average age at entry was 34, six years below the general average.

(609) Albumin, constant, large amount.
X Found on examination.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
Substandard	6,893	70	23.47	298% ± 24

In the standard section only two deaths were recorded.

The company ratings averaged 225%.

The death rate from Bright's disease was 22 times the normal. These formed one-third of the deaths.

The average age at entry was 31, nine years below the general average.

(601-609) Albumin, any frequency and any amount, with 30% or more overweight.
X Found on examination.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
Standard	969	14	4.50	311% ± 56
Substandard	7,255	110	38.34	287% ± 17

The company ratings averaged 190%.

Tests in a representative section of the data showed that the average degree of overweight was 40%.

The death rates from organic disease of the heart, Bright's disease and cerebral hemorrhage were 6, 5 and 4 times the normal, respectively.

The mortality ratio was distinctly higher at the later than the earlier durations. With regard to age at entry it was highest in the age group 40-49.

Examination of 110 of the deaths, standard and substandard, was made to determine the proportionate distribution of the cases by frequency and by amount of the albumin with the following results:

	Code No.	Deaths	Percentage
Accidental or not specified	(601)	37	34%
Intermittent, trace	(603)	15	13
" moderate	(604)	3	3
Constant, trace	(607)	42	38
" moderate	(608)	8	7
" large amount	(609)	5	5
		110	100%

Consideration was given to the desirability of making separate investigations of parts of this group in order to allocate the cause of the high mortality experienced. It was found, however, that it was unnecessary to go to that labor as the average of company ratings (190%) was made up of about 140% for albumin and 50 points added for overweight. Furthermore the amount of material in the groups with a moderate or large amount of albumin was small. If the experience in the respective albumin classes were combined in proportions similar to those of this group, the mortality ratio experienced would have agreed approximately with the company ratings. The 100 points by which the actual experience exceeded the ratings represent, therefore, the

excess mortality due to the combination of impairments. The combination of albumin and overweight, like that of rheumatism and mitral regurgitation apparently gives rise to a mortality considerably greater than that represented by the addition of the respective ratings.

(601-609) Albumin, any frequency and any amount.
B One finding within 2 years of application.

This class covered all types from an accidental finding of albuminuria to constant albuminuria in large amount, although there would naturally be very few of the latter. An examination of 257 of the deaths showed that in 96% the impairment was (601), that is accidental. It is not, therefore, a matter of surprise that the mortality among those accepted as standard was 119%±4, the actual deaths being 641 and the expected 538. There were only sixteen deaths in the substandard section which had a mortality better than the normal.

The Company ratings averaged 120%, after taking account of the large proportion of the data among the accidental type of albuminuria.

The M. A. M. I. showed a mortality ratio of 103%±12.

The death rates from suicide and Bright's disease were 1½ and 2¼ times the normal, respectively. Influenza and cancer were each low at (¾) the normal.

Summary of Classes of Albuminuria

There were eight classes of albuminuria; of these, six were differentiated by frequency and by amount found on examination, one was a combination of albumin with overweight and the last a history of albumin within two years. A summary of the substandard experience in the six classes mentioned is tabulated below:

	Intermittent (603-605)				Constant (607-609)			
Amount of Albumin	Actual Deaths	Mortality Experienced Substandard	Average Company Rating	Excess Points	Actual Deaths	Mortality Experienced Substandard	Average Company Rating	Excess Points
Trace.....	194	129%± 6	135	+6	492	173%± 5	145	−28
Moderate Amount..	39	150%±17	150	0	200	174%± 9	185	+11
Large Amount.....	14	307%±55	210	−97	70	298%±24	240	−58

As was expected, the mortality ratios increase with an increase in the frequency of the findings or in the amount found. The mortality in the large group of cases with a constant trace of albumin is higher than had been anticipated, and a similar result appears for a large amount of albumin, whether intermittent or constant. The material among cases with a large amount is comparatively small, but the results shown are mutually confirmatory. In 1925 Rogers and Hunter (T. A. S. A., XXVI, p. 290) showed mortality ratios of 98%±7 for intermittent trace, and 162%±6, 227%±18, and 323%±32 for constant trace, moderate amount and large amount, respectively. It may be noted that for constant moderate and large amount, these results are higher than those now brought forward. In their investigation about 20% of the data had been exposed for over ten years, whereas in the present one only 10% comes in this category, and in both investigations common causes of death were of the degenerative type, as for instance, Bright's disease. From the foregoing it would seem that caution should be used in determining ratings based on this part of the present experience. As regards intermittent trace of albumin, the Joint Committee's report in 1920 with a mortality of 109%±10 in ratio to the M. A. table, and representing the experience of a number of companies, was probably not very different from the present result when allowance is made for the improvement in the basic or standard

mortality. Among cases with a history of albumin within two years, and which were mainly of the accidental type, the mortality experienced was similar to that among cases with an intermittent trace found on examination. This result confirms the practice of rating these two types the same. The combination of albuminuria and overweight was dealt with under that class.

The tendency to an increase in relative mortality as the age increases was referred to in the Joint Committee's report of 1920. This feature appears in the present data, the highest ratio being consistently shown in the age-at-entry group 40-49. This appears in the following table, in which standard and substandard data are combined in order to obtain a sufficient volume of data.

Mortality Ratios for Albuminuria

Ages at Entry	Intermittent (603-605X)	Constant (607-609X)	History (601-609B)	With Overweight (601-609X)
15-29	110% ± 7	128% ± 5	103% ± 4	138% ± 30
30-39	125% ± 9	186% ± 7	115% ± 5	300% ± 30
40-49	133% ± 9	197% ± 12	143% ± 6	406% ± 37
50 & over	129% ± 9	162% ± 10	113% ± 5	248% ± 30

The percentage of deaths assigned to Bright's disease is of interest and the following table compares these for the present substandard data with those found by Rogers and Hunter in 1925, their investigation having dealt with substandard data only.

Percentage of Deaths due to Bright's Disease

		Present Data	1925 Study
Intermittent	Trace	10%	10%
	Moderate	23	..
	Large Amount	29	..
Constant	Trace	21	25
	Moderate	20	31
	Large Amount	37	45

Although the new figures were derived from a larger volume of data, they are not so regular as those of the investigation in 1925.

In a combination of all the data on albuminuria, the death rates from tuberculosis of the lungs, apoplexy, cirrhosis of the liver, pneumonia and suicide were each 1½ times the normal, those from organic disease of the heart 1¾ times the normal and from Bright's disease 4 times the normal. In a representative section of the material there were 38 deaths from myocarditis, endocarditis and pericarditis against an expected of about five.

(611) Casts, hyaline, intermittent.
(612) Casts, hyaline, constant.
(613) Casts, granular, intermittent.
(614) Casts, granular, constant.
X Found on examination.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
Standard	52,436	555	581.14	96% ± 3
Substandard	4,036	59	38.51	153% ± 14

The company ratings averaged 115%, varying according to the number of casts found. The average of these ratings has been adjusted to omit granular casts since these rarely appeared among the data. The ratings varied as the number of casts found; the average number found in accepted business was considered to be two when albumin was not also present.

The average age at entry was 48, eight years above the general average.

The death rate from cerebral hemorrhage was 1½ times the normal. Tuberculosis of the lungs, appendicitis and cancer were low at (¼), (½) and (¾) the normal, respectively.

Among the standard cases, the mortality ratio increased as the duration advanced.

The company which contributed practically all the standard data and which had a standard mortality makes a greater proportion of microscopic examinations than is customary among companies. Casts were therefore detected by this company in a great many cases which would be accepted standard by other companies without any record of casts having been noted. A few companies which supplied practically all the substandard cases in this class, regarded them as such only when other conditions caused them to make a microscopic examination. These cases would, therefore, in advance be anticipated to be of a different character from those first mentioned.

In regard to the standard data, it is important to notice that the mortality in years of duration, 11-19, was distinctly higher than the relative mortality in the earlier years.

Nearly 500 of the deaths were examined to see how the data were divided among the four code-numbers. There were two deaths under (613) and three under (614); practically all the material came therefore from the hyaline cast groups. In the substandard section half of the data were in (612), while in the standard section two-thirds were (612).

In impairment (611-614) 90% of the material was contributed by four companies. They were asked to subdivide the hyaline cast cases into two parts—(611) intermittent, and (612) constant. The following mortality ratios resulted:

Standard.....	(611)	99%± 5	(612)	97%± 4
Substandard.....	(611)	142%±20	(612)	230%±30

Those which had been classified as standard gave a normal mortality in each class while the substandard cases showed a higher mortality where the casts were constant rather than intermittent.

(620-627) Glycosuria.

The standards of measurement are as follows:

"Accidental," if found in one of several tests.

"Intermittent," if found in two out of three or four tests.

"Constant" (or "Persistent"), if found in two out of two, three out of three, or three out of four tests, and when more than a trace, if found in two out of three tests.

(620) Glycosuria—Not specified, or found in only one specimen.

X Found on examination.

B One finding, within 2 years of application.

		Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
X	Standard.....	34,967	219	222.37	98%± 5
B	Standard.....	51,617	392	347.08	113%± 3
X, B	Standard.....	86,584	611	569.45	107%± 3

The amount of the substandard material in X consisted of only 12 deaths and in B of only 13 deaths, both showing a lower mortality than 100%.

In general the companies requested further information before specifying a rating; in cases which were classed as accidental the average company rating was 120%, and the general practice was to include recent histories as though found on examination.

The M. A. M. I. showed mortality ratios of 95% ± 14 and 104% ± 8 for X and B, respectively.

The death rate from diabetes was 5½ times the normal which was practically the same as in the M. A. M. I. The death rate from organic disease of the heart was 1½ times the normal.

The mortality ratio increased as the duration advanced and was higher at issue ages over 40 than at ages under 40. The age group 40-49 had the highest ratio.

Over 400 dead cases were examined to see whether they were "accidental" or "not specified." Four-fifths of them were found to be of the accidental type (i.e. found in only one specimen), which accounts for the low mortality in this class.

(623) Glycosuria, no diet, intermittent, less than ½% sugar.
(624) Glycosuria, no diet, intermittent, from ½ to 1% sugar.
X Found on examination.
B One finding, within 2 years of application.

These two classes were considered together as they were small and similar in the mortality experienced.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
X Substandard	10,185	69	56.60	122% ± 10

In the standard section of X only three deaths were recorded. In B only five deaths were recorded in the standard section and two in the substandard section. The greater part of the material was in (623), there having been only eleven deaths in (624X).

The company ratings averaged 140% and 125% for X and B respectively in (623) and 230% and 185% for X and B respectively in (624).

There were eleven deaths from diabetes against an expected of less than one. Eight deaths were due to cancer.

As the data were scanty, a single detail table was prepared for (623, 624, 626, 627), all of the specified glycosuria cases in the investigation.

(626) Glycosuria, no diet, persistent, less than ½% sugar.
(627) Glycosuria, no diet, persistent, from ½% to 1% sugar.
X Found on examination.
B One finding within 2 years of application.

These two classes were combined since they were small and of equal mortality.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
X Substandard	5,631	49	29.61	165% ± 17

In the standard section of X there was very little exposure and no deaths were recorded. In all of (626B) only one death was recorded. Impairment (627B) was not included in the investigation. In the substandard section of X there were 31 deaths in (626) and 18 deaths in (627).

The company ratings averaged 200% and 165% for X and B respectively in (626) and 260% for (627X).

There were eight deaths from diabetes against an expected of less than one. Seven deaths were from heart disease and 6 from cancer.

Summary of Classes of Glycosuria

By comparing the mortality experienced with the average company ratings in the five classes dealing with glycosuria, it is evident that the mortality was lighter than had been expected. The death rates increase with the frequency of the finding of sugar and this result is in accordance with

what has been anticipated. The mortality experienced is lower than that shown by Hunter and Rogers in 1925 with a larger volume of data, all of which was substandard (T. A. S. A., Vol. XXVI, p. 290). For cases which may be compared with the "intermittent" group in the present investigation, the mortality ratio shown was 145% ± 12, and for a similar "persistent" group, 275% ± 17. The variance in the mortality experienced may be partly explained by the difference in the methods of selection of the present data, and those used in the early years of the period investigated by Rogers and Hunter when in some cases the information relative to restricted diet was furnished by the applicant. It is possible, however, that the extra mortality shown by Rogers and Hunter may be due to the longer period of duration. Under (620) it was noted that the mortality ratio increased with duration. The principal causes of death were of the degenerative type. Whereas the present data were not large enough to differentiate consistently between a trace and a moderate amount, the material contributed in the paper referred to did make such a differentiation.

The relative mortality by age at issue in the present data tends to a maximum at ages 40-49 and afterward declines. This is the same characteristic as was discussed under impairment (344)—high systolic blood pressure. In view of the above facts it will be evident that the favorable mortality now brought forward should be accepted with caution.

In a combination of all cases of glycosuria the death rates from diabetes and from organic disease of the heart were 6½ and 1¼ times normal respectively. Cancer showed a standard mortality. The following causes of death, which owing to the paucity of data were not significant in the individual classes, now show significantly low rates in the combination—influenza and apoplexy each at (½) normal and tuberculosis of the lungs and Bright's disease each at (¾) normal.

The mortality was higher at the older ages at issue than at the younger ages and increased as the duration advanced.

(643) Renal colic, calculus, gravel, without operation.
B-C One attack, within 2-5 years of application.
D One attack, within 6-10 years of application.
G-J Two or more attacks, last within 10 years of application.

		Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
B-C	Standard.....	37,884	225	264.76	85% ± 3
D	Standard.....	22,923	176	190.82	92% ± 5
B-C, D	Substandard....	12,750	74	71.36	104% ± 28
G-J	Standard.....	10,466	105	79.88	131% ± 9
	Substandard....	6,961	43	42.84	100% ± 10
B-C, D, G-J	Standard.....	71,273	506	535.46	94% ± 3
	Substandard....	19,711	117	114.20	102% ± 6

The company ratings averaged 120%, 100% and 130% for B-C, D and G-J, respectively. For a group not specified as to operation, but very carefully selected the M. A. M. I. showed a mortality ratio of 99% ± 4.

The death rates from influenza, pneumonia and tuberculosis of the lungs were lower than the normal, while those from cerebral hemorrhage and Bright's disease were higher than normal. In the standard data, for two or more attacks, there were six deaths from diabetes against one expected.

(644) Renal colic, calculus, gravel, with operation.

B-C One attack, within 5 years of application.

D One attack, within 6-10 years of application.

G-J Two or more attacks, last within 10 years of application.

		Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
B-C, D, G-J	Standard.....	5,871	41	31.94	128%±13
	Substandard....	5,530	52	27.78	187%±17

The material was not large enough to justify further subdivisions, but it may be mentioned that the mortality in B-C was lower than in D (28 deaths) or in G-J (14 deaths).

In the standard section of G-J only three deaths were recorded.

The company ratings averaged 120%, 100% and 130%, for B-C, D and G-J, respectively. For the standard and substandard data combined the mortality experienced was 141%±13 for B-C, 172%±22 for D, and 195%±35 in G-J.

The death rate from Bright's disease was 4 times the normal. A similar result was found in the M. A. M. I.

Summary of Classes of Renal Colic

When the data for renal colic are compared at all ages combined with those in the M. A. M. I. the mortality ratios agree very closely. The new material is of larger volume, as indicated by the smaller probable deviation. It includes both standard and substandard data.

	Mortality Ratios (Operated or Not Operated)			
	New Data		M. A. M. I.	
(643, 644)	B-C.....	92%±4	B-C.....	95%± 6
	D.....	102%±4	D.....	102%± 6
	G-J.....	125%±6	G-K.....	116%±10
	B-J.....	101%±2	B-K.....	99%± 4

The following compares the new experience with the company ratings, standard and substandard data having been combined:

		Experience	Company Ratings	Excess Points
(643) Not operated	B-C.....	86%± 3	120%	+34
	D.....	97%± 5	100	+ 3
	G-J.....	121%± 6	130	+ 9
		96%± 3	115%	+19
(644) Operated	B-C.....	141%±13	120	−21
	D.....	172%±22	100	−72
	G-J.....	195%±35	130	−65
		156%±11	115%	−41

This shows clearly that the operated cases have had a worse experience than the others, and that upon the whole the company ratings have been adequate. In 1928 Rogers and Hunter found that the operated cases had a mortality 40% higher than the others.

The other question of interest in regard to renal colic is the mortality according to age at entry. In both the M. A. M. I. and the Rogers-Hunter data the mortality was high at ages below 40 among those who had suffered two or more attacks. This feature does not appear in the present much larger experience, for the relative mortality did not differ significantly by age under cases with two or more attacks.

In a combination of all the data on renal colic the death rates from apoplexy and Bright's

disease were each 1½ times the normal. Low rates of mortality were shown by influenza and pneumonia, each at (¾) normal, by warfare and tuberculosis of the lungs, each at (½) normal and by cirrhosis of the liver at (¼) normal.

(645) Nephritis

B-J One attack at any time prior to application, two or more attacks, last within 10 years of application.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
Standard.....	9,522	47	47.25	99%±10

The company ratings averaged 175%.

Six of the deaths were due to Bright's disease, (twice the normal proportion).

In the substandard section there were only 12 deaths with a mortality of nearly twice the standard, a result which may partly be due to accidental fluctuations.

(646) Nephrectomy.

B Within 2 years of application.
C Within 3, 4, 5 years of application.
D Within 6-10 years of application.
F Over 10 years prior to application.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
B, C, D, F Substandard.....	6,537	28	29.76	94%±12

In the standard section there were no deaths in B and 5, 1 and 1 in C, D and F, respectively, with a normal mortality. In the substandard section there were 9, 2, 7 and 10 deaths in B, C, D and F, respectively.

For standard and substandard combined, the mortality ratios were 218%±48 for B, and 75%±10 for C, D and F, combined.

The company ratings averaged 250%, 205%, 180% and 165% for B, C, D and F, respectively.

The death rates in this impairment class were considerably below those anticipated.

(656) Inflammation of prostate gland.
(657) Enlargement of prostate gland.

X-F One attack, found on examination, or at any time prior to application.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
Standard and Substandard....	8,573	51	64.82	79%± 7

The company ratings averaged 170% for each of these impairments.

The average age at entry was 45, five years above the general average.

Two-thirds of the death losses were examined with the following result. All the substandard cases were impairment (657), eight operated and four not operated prior to application for insurance. The standard cases were equally divided between operated and not operated and also between inflammation and enlargement.

(667) Hysterectomy.

B-C Within 5 years of application.
D Within 6-10 years of application.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
B-C, D				
Standard and Substandard.	13,400	71	86.47	82%± 7

The extent of the data in each group was very limited; as all subdivisions showed a normal mortality the total only has been given.

The company ratings averaged 140% and 115% for B-C and D, respectively.

About one-fourth of the deaths were due to cancer and one-eighth to Bright's disease, both above the normal.

It appears that careful selection was exercised in this class. There was a tendency for the mortality ratios to be higher at the young ages.

(669) Ovariotomy.
B Within 2 years of application.
C Within 3, 4, 5 years of application.
D Within 6-10 years of application.

		Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
B, C	Standard.....	8,346	29	34.87	83%±10
	Substandard.....	5,731	46	22.68	203%±20
D	Standard and Substandard.....	8,907	38	43.68	87%±10
B, C, D	Standard.....	15,920	64	71.65	89%± 7
	Substandard.....	7,064	49	29.58	166%±17

There were only three deaths in the substandard section of D and so they were combined with the standard data above.

The company ratings averaged 160%, 110% and 100% for B, C and D, respectively.

There were 15 deaths from cancer and 14 from all forms of tuberculosis—both distinctly above the normal proportion.

As regards cancer, however, it may be noted that among women it is usually about twice as frequent a cause of death as among men, entirely apart from the influence of a given impairment. This remark applies also to impairment (667).

Summary of Miscellaneous Genito-Urinary Impairment Classes

The mortality experienced has been practically standard for the five classes here considered, a much lighter mortality than had been anticipated. It appears that this is the first time that the mortality under any of the impairments (645), (646), (656), (657), (667) and (669) has been investigated.

Habits as to Alcohol (801-807)

There were three different methods used by the companies in regard to the time-code under these impairments. They differed as to whether or not they indicated the duration over which the alcoholic habits continued. There were not enough deaths however to warrant subdividing along these lines. Accordingly, the data were combined as regards time-code to include all the material from X to K.

The investigation into the effect of alcohol on longevity, code nos. (801-807) inclusive, was unsatisfactory, due to the nature of the problem. In the first place it is difficult to obtain accurate information regarding applicants who use alcoholic beverages to an immoderate extent occasionally or who take a larger daily amount than is usually considered moderate; and in the second place the individual companies have placed different interpretations on the information obtained with regard to the applicants' use of alcohol. For example, two companies which furnished nearly 90% of the material under the heading of "Steady free user, never intoxicated" (806), considered that applicants who took daily two glasses of beer or one glass of whiskey or the equivalent came within this group; while two other companies, both large, contributed very little material to the experience of the group, due partly to lack of information for coding this impair-

ment. Another factor to be taken into account is that, as adverse information regarding habits often comes from the examining physician or from other sources available to the companies, the material in any class is certain to be heterogeneous and the results of only broad significance. Wherever the Committee considered from its knowledge of the underlying conditions that the results were reasonable, they are now given.

(801, 802) Alcohol, immoderate use, averaging 6 to 12 times a year.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
Standard	46,327	289	265.03	109% ± 4
Substandard	21,458	231	118.29	195% ± 8

The foregoing indicates that in the best type of cases in which the company received information of an occasional immoderate use of alcohol, i.e., drinking to the point of intoxication a few times a year, the mortality was 9% above the normal; but that in the other cases accepted as substandard risks, where the statement regarding the immoderate use was probably underestimated, the results were distinctly unsatisfactory. Unfortunately in the M. A. M. I. there was no group corresponding to the foregoing with which comparison could be made.

The company ratings averaged 155%.

The death rates from suicide, pneumonia, and accident were 2¾ times, 1¾ times and 1½ times the normal, respectively. There were 8 deaths from cirrhosis of the liver against less than 3 expected deaths.

The mortality ratio was higher at the younger ages than at the older ages.

(804) Alcohol, immoderate use, lasting 2 or 3 days, not oftener than 3 times a year.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
Substandard	10,536	218	65.87	331% ± 17

This is largely the experience of one company which contributed 90% of the data and whose ratings averaged 225%.

The death rates from Bright's disease and from cerebral hemorrhage were 4½ times and 4 times the normal, respectively; from pneumonia and influenza they were 3½ times and 2¾ times, respectively, while from accident and organic disease of the heart they were 3 times the normal in each case.

The mortality was higher at the younger than at the older ages.

(806) Alcohol, steady free user, never intoxicated.

The data were very heterogeneous, the majority being contributed by companies which put a very conservative interpretation on the code. The Committee does not consider that a moderate use of alcohol, such as two glasses of beer a day would constitute a "free user." In this class, which contained the largest amount of material in the investigation, there were 4,761 actual deaths and 4,126 expected deaths in the standard class with a relative mortality of 115% ± 1. This included only a small amount of data in which those insured who reached the standard limit of two ounces of alcohol per day or higher were considered "steady free users," much the larger portion being users of less. In the substandard section there were 29 deaths with 11.7 expected and a mortality of 248% ± 30, indicating that when cases were treated as substandard the applicants were very likely to be free users.

The death rates from the various diseases indicated that alcohol had been used to a considerable extent by some of the policyholders in the standard section. Thus, the death rate from cirrhosis of the liver was 2¾ times the normal, from suicide and cerebral hemorrhage, 1½ times the normal, and from Bright's disease and pneumonia, 1¼ times the normal.

The mortality ratio was higher at the younger than at the older ages,—the same condition as was found under classes (801), (802) and (804).

Summary of Classes Dealing With Alcoholic Habits

The conclusions which the Committee have reached are as follows:

1. That the companies did not always use the same code in describing habits as to alcohol.
2. That occasional intoxication or protracted sprees undoubtedly result in a high mortality among such groups.
3. That the experience of individual companies would be of more value than a collective investigation as there would be more uniformity of action and greater consistency in the treatment of individual cases.
4. That any attempted differentiation between the mortality experience of insurance taken prior to the Prohibition Amendment and since that time would be of little value.

(811) Amputation, leg above knee.
X-F At any time prior to application.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
Standard	8,595	47	43.15	109%±11
Substandard	5,184	33	23.43	141%±17

The extra mortality was one per 1,000.

The company ratings averaged 140%. In the M. A. M. I. the mortality ratio was 120%±11, the same as in the present larger study.

No cause of death was significant and there were only four deaths from accident against seven expected.

(821) Blindness, one eye.
X Found on examination.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
Standard	43,996	256	231.82	110%± 4
Substandard	5,411	37	25.82	143%±16

The company ratings averaged 115%.

The death rate from accident was 1½ times the normal. Cerebral hemorrhage and cancer were both above normal.

This appears to be the first time that the mortality under this impairment has been investigated.

(822) Blindness, total.
X Found on examination.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
Substandard	4,298	36	22.92	157%±17

There were no deaths in the standard section.

The company ratings averaged 160%.

No single cause of death was significantly high in this small class. There were no deaths from accident. In the M. A. M. I. there were 15 deaths, six of which were due to accident or suicide.

(834) Deafness, marked or total.
X Found on examination.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
Standard	43,019	299	302.16	99%±4
Substandard	15,493	118	92.76	127%±8

The company ratings averaged 140%. The M. A. M. I. showed a mortality ratio of 129%±16.

In the substandard group, the death rate from cerebral hemorrhage (14 deaths) was 2¾ times the normal. In the entire class there were 33 deaths from this cause, about 1½ times the expected. The death rate from accident was not significantly high although in the substandard group fourteen of the deaths were due to accident (1½ times the normal proportion).

The mortality ratio was higher in the first five policy years than at the later durations.

(834) with (835)—Deafness, marked or total (834) with mutism (835).
(835)—Mutism.

Mutism is so often confused with deaf mutism (834) with (835) that the results for the combination are recorded here for convenience of comparison.

X Found on examination.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
(834) with (835) and (835) Substandard.....	4,790	28	19.44	144%±19

In the standard section there were only 5 deaths in (834) with (835) and no deaths in (835).

The company ratings ranged from 150% to 190% for (834) with (835) and averaged 155% for (835). For the standard and substandard data combined, the corresponding mortality ratios were 102%±15 and 263%±47.

There were six deaths due to accident against one expected death.

This appears to be the first time that the mortality among deaf mutes has been investigated.

(841) Appearance fragile, not robust.
X Found on examination.
(a) 10% or more underweight.
(b) 9% under to 9% overweight.

		Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
X (a)	Substandard.....	21,508	157	102.41	153%± 8
X (b)	Substandard.....	5,742	43	24.80	173%±17
X (a), (b)	Standard.....	7,286	55	32.55	169%±15
	Substandard.....	27,250	200	127.21	157%± 8

There were too few deaths in the standard section of X (b) to justify any conclusions.

The company ratings averaged 165% and 140% for (a) and for (b), respectively.

The death rates from tuberculosis of the lungs and pneumonia were 4½ times and twice the normal, respectively. The death rates from cancer and organic disease of the heart were 2¼ and 1¾ times the normal, respectively. There were no deaths from diabetes, nor from cirrhosis of the liver, and only two deaths from suicide, one-fourth the normal proportion.

In 1923 Rogers and Hunter brought forward an experience a little larger than the above but composed of substandard data only. The mortality in relation to the company's standard was not very different from that of the present experience. At that time it was found that the rating for underweight alone was on the average less than ten points, so that there was little difference between the two groups,—(a) underweight and (b) average weight.

(860) Abdomen 2¼ to 3 inches greater than chest expanded.

X Found on examination.
(a) 0-29% overweight.
(b) 30-39% overweight.
(c) 40% or more overweight.

		Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
X (a)	Standard.....	5,653	61	43.33	141%±13
	Substandard...	4,739	76	46.59	163%±13
X (b)	Substandard...	3,799	57	30.86	185%±17
X (c)	Substandard...	3,616	50	20.84	240%±22
X (a), (b), (c)	Standard.....	6,790	69	55.68	124%±10
	Substandard...	12,154	183	98.29	186%± 9

In the standard sections of (b) and (c) eight deaths were recorded.

The company ratings averaged 130%, 175% and 215% for (a), (b) and (c), respectively. After adjustment to allow for slightly different weight groups, the M. A. M. I. showed a mortality ratio of 122%±6 for (a), 158%±16 for (b) and 166%±18 for (c).

The death rate from cirrhosis of the liver was 7½ times the normal. Those from diabetes, Bright's disease and organic disease of the heart were 3½, 3 and 2¼ times the normal, respectively. There was only one death from tuberculosis of the lungs against ten expected deaths. In a representative section of the material there were five deaths from myocarditis, endocarditis and pericarditis against less than one expected. The M. A. M. I. also showed a high mortality from diabetes, Bright's disease and heart disease and a low mortality from tuberculosis of the lungs.

Several companies based their data on the excess of the abdomen over the chest at rest instead of expanded. A correction to allow for the difference of 1½ to 2 inches was made at the Central Bureau.

(861) Abdomen over 3 inches greater than chest expanded.

X Found on examination.
(a) 0-29% overweight.
(b) 30-39% overweight.
(c) 40% or more overweight.

		Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
X (a)	Standard.....	2,291	24	20.00	120%±17
	Substandard...	2,386	42	19.13	220%±22
X (b)	Substandard...	1,562	26	11.02	236%±31
X (c)	Substandard...	2,041	31	13.12	236%±28
X (a), (b), (c)	Substandard...	5,989	99	43.27	229%±16

In the standard section there were only 2 deaths in (b) and none in (c).

The company ratings averaged 140%, 200% and 240% for (a), (b) and (c), respectively. After adjustment to allow for slightly different weight groups, the M. A. M. I. showed a mortality ratio of 123%±7 for (a), 158%±17 for (b) and 200%±20 for (c).

The death rates from pneumonia, cerebral hemorrhage and Bright's disease were 2½, 2¾ and 3½ times the normal, respectively. There were 13 deaths from cancer (1½ times the normal proportion), 11 deaths from organic disease of the heart (1¾ times the normal proportion) and 5 deaths from diabetes against one expected death. There were no deaths from any form of tuberculosis. In a representative section of the material there were 6 deaths from myocarditis,

endocarditis and pericarditis against less than one expected. The M. A. M. I. also showed a high mortality from pneumonia, cerebral hemorrhage, Bright's disease and diabetes and a low mortality from tuberculosis.

In the substandard section the average age at entry was 45, five years above the general average.

Summary of Classes of Excessive Abdominal Girth

In order to learn if the relationship between the relative mortality experienced and the degree of overweight varied from that expected as shown by the average company ratings and the trend of such variation, if any, a table was prepared combining the standard and substandard data. In class (860) the mortality under (b) was the same as that under (a), although there was a fair amount of data. An analysis showed that this was largely due to the very conservative underwriting of one company which issued standard policies only, so, in the following table, the mortality experienced in the substandard section only has been shown. The variation in the mortality experienced in class (861) can be ascribed only to the paucity of the data. Although the figures of the M. A. M. I. are shown, it should be remembered that they did not include any cases designated as substandard.

	Mortality Experienced Substandard	Average Company Rating Substandard	M. A. M. I.
(860) Abdomen 2¼ to 3 inches greater than chest expanded (860)			
(a) 0-29% overweight	163%±13	140	122%± 6
(b) 30-39% overweight	185%±17	175	158%±16
(c) 40% or more overweight	240%±22	215	166%±18
All	186%± 9	175	132%± 5
(861) Abdomen more than 3 inches greater than chest expanded (861)			
(a) 0-29% overweight	220%±22	150	123%± 7
(b) 30-39% overweight	236%±31	200	158%±17
(c) 40% or more overweight	236%±28	240	200%±20
All	229%±16	195	147%± 7

Combining the material for the two groups under substandard plans, the following are the results:

	Actual Deaths	Mortality Experienced
(a)	118	180%±11
(b)	83	198%±14
(c)	81	239%±17

It will be observed that these ratios increase with degree of overweight in a normal manner.

The present classes are not so large as those of the M. A. M. I., where also a greater degree of subdivision by both girth and build was made. The present material was prepared before the new investigation of mortality by build had been finished. Accordingly, a comparison with the mortality in corresponding build-groups cannot be made.

In a combination of all the data on excessive abdominal girth the death rates from cirrhosis of the liver, from diabetes and from Bright's disease were 7, 4, and 3 times the normal, respectively.

High death rates were also shown by organic disease of the heart, influenza and pneumonia at 2¼, 2 and 2 times the normal, respectively. The mortality ratio from suicide was (½) normal. It is a noticeable fact that only one of the 377 deaths in all the data on excessive abdominal girth was due to tuberculosis of the lungs.

(871) Exophthalmic goitre, with operation.

B Operation, within 2 years of application.
C Operation, within 3, 4, 5, years of application.
D-F Operation, over 5 years prior to application.
G-J Small, medium or large goitre.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
B, C, D-F each with G-J. Standard and substandard combined.....	5,217	17	21.84	78%±12

In the standard section there were 1, 3 and 4 deaths in B, C and D-F (each with G-J), respectively, and in the substandard section there were 2, 6 and 1 deaths in B, C and D-F (each with G-J), respectively.

Cases with a record of operation within two years of application were generally declined, but for C and D-F (each with G-J), the company ratings averaged 165% and 115%, respectively.

There were 4 deaths from cancer against less than two expected.

It is evident that the data in this small class were selected with great care, since the mortality was even lower than among cases of simple goitre.

The U. S. Mortality Statistics show a constant increase from 1900 to 1926 in the death rate from exophthalmic goitre. The rate of 1926 is 10 times that of 1900. Since 1926, however, there has been a slight decline.

(872) Simple goitre, without operation.

X-F Found on examination or one attack at any time prior to application.
G Small goitre.
H Medium sized goitre.

		Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
X-F, G	Standard.....	48,911	156	182.25	86%± 4
	Substandard.....	25,327	92	89.18	103%± 7
X-F, H	Standard.....	8,586	34	36.11	94%±10
	Substandard.....	6,060	27	24.91	108%±14
X-F	Standard.....	40,198	136	162.35	84%± 5
	Substandard.....	15,979	47	60.24	78%± 8
	Total Standard.....	97,695	326	380.71	86%± 3
	Total Substandard..	47,366	166	174.33	95%± 5

The company ratings averaged 125% and 140% for small and medium goitres, respectively. In X-F, size of goitre not specified, there may have been many cases with only minor symptoms of the impairment.

Cancer, tuberculosis of the lungs and organic disease of the heart showed a distinctly lower death rate than the normal.

In the substandard section the average age at entry was 34, six years below the general average.

(873) Simple goitre, with operation.

B Operation, within 2 years of application.
C Operation, within 3, 4, 5 years of application.
D-F Operation, over 5 years prior to application.
G-J Small, medium or large goitre.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
B, C with G-J Standard.....	6,901	44	29.94	147%±15
D-F with G-J Standard.....	5,945	32	27.31	117%±14
B, C, D-F each with G-J				
Standard	12,846	76	57.24	133%±11
Substandard ...	6,893	21	26.70	79%±12

In the substandard section there were 6 deaths in B (G-J) and 3 in D-F (G-J).

The company ratings averaged 195%, 125% and 105% for B, C and D-F, respectively, each with G-J. For standard and substandard combined, the corresponding mortality ratios were 116%±15 for B (G-J), 121%±13 for C (G-J) and 110%±12 for D-F (G-J).

Summary of Classes of Goitre

Reviewing at this point the three classes of goitre, it is evident that the company ratings have been adequate for the cases as they have been selected. The fact that the lowest mortality was under exophthalmic goitre suggests that such cases must have been selected with great care, for this is a phenomenon which could hardly be expected in the general population. The higher mortality among the operated cases was in part anticipated and may be largely explained by the more serious cases being the ones operated upon. There was no class of goitre in the M.A.M.I. The two classes of simple goitre (872 and 873) are large enough to indicate that the impairment when not accompanied by complications is of minor importance except within the first year or two after operation or when the goitre is quite large.

In a combination of all cases of goitre, the death rates from appendicitis and suicide were 1¾ and 1½ times the normal, respectively. As would be expected in a group which showed a low relative mortality, the causes of death for which significantly low rates were recorded, are numerous.

(885) Spinal curvature.

This includes hollow back, humpback and lateral curvature, but does not include cases which have a history of infantile paralysis (263) or tuberculosis of the bones (141). Angular curvature or Pott's disease is included under (141).

X-F Found on examination, or one attack at any time prior to application.

Some companies recorded their statistics according to the number of years elapsed since the attack occurred; others simply recorded that the spinal curvature was found on examination. These two types were combined.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
X-F Standard.....	14,253	79	74.78	106%± 8
Substandard.....	16,593	117	72.45	161%±10

The company ratings averaged about 165% and did not in general discriminate between the different types of curvature. The M. A. M. I. showed a mortality ratio of 170%±11.

The death rates from organic disease of the heart and pneumonia were 1¾ and twice the normal, respectively. A similar result was found in the M. A. M. I. There were nine deaths from tuberculosis other than pulmonary against less than two expected.

In the substandard section the average age at entry was 35, five years below the general average.

Scoliosis (lateral curvature) is believed to be the commonest of the three forms of curvature, and has been said to be much more frequent among women than among men, a proportion of five to

one having been accepted. Lordosis (hollow back) had also been found more frequently among women. A test of 2,000 entrants in the present data, however, showed 11% women, a normal proportion for lives insured in "ordinary" companies. In determining this figure those companies were excluded which contributed data for men only. It may be noted that for all types of curvature together this would indicate an equal proportion of men and women. The suggestion has been made that the improvements in wearing apparel, a greater participation in sports, and public education in hygiene and posture may have reduced the frequency of these impairments among women especially. On the other hand, the data do not show the influence of occupation, nor of social class.

About 100 of the death losses were examined to determine the distribution according to type of curvature; of these, one-fourth were not specified. Of those that were specified, 50% were humpback, 40% lateral curvature and 10% hollowback.

Combinations of Impairments

Several impairments were combined with systolic blood pressure of 15 mm. or more above the average for the age. The following table was used for the blood pressure:

Ages	+15 and more (X2)
15-29	135+ Mm.
30-44	140+ Mm.
45-53	145+ Mm.
54-70	150+ Mm.

(302) with (X2) Apex murmur, systolic, constant, transmitted to the left (302) with systolic blood pressure 15 or more Mm. above the average for the age (X2).

X Found on examination.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
Substandard.....	13,808	135	67.16	201% ± 12

In the standard section only 4 deaths were recorded.

The company ratings averaged 245%.

The death rates from organic disease of the heart and Bright's disease were 4½ and 3 times the normal, respectively.

(302) with G-H with (X2)—Apex murmur, systolic, constant, transmitted to the left with slight or moderate hypertrophy. (302 with G-H)—with systolic blood pressure, 15 or more Mm. above the average for the age (X2).

X Found on examination.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
Substandard.....	7,113	92	32.92	279% ± 20

In the standard section no deaths were recorded.

The company ratings averaged 250%.

The death rate from organic disease of the heart was 14 times the normal.

(314, 315) with (X2)—Basic murmur, aortic area, diastolic, constant, transmitted downward (314), aortic regurgitation, not clearly in (314), i.e. (315), with systolic blood pressure 15 or more Mm. above the average for the age (X2).

X Found on examination.

X (G-H) Found on examination with slight or moderate hypertrophy.

In general these cases were declined and so the data submitted in this group probably represent a rigid selection. There were 14 deaths with 3.89 expected, a ratio of 360%.

Of the 14 deaths, five were from organic disease of the heart.

(601-609) with (610-616) with G-J—Albumin, any amount or frequency (601-609), with 1-10 casts, hyaline, granular or epithelial, any frequency (610-616) with G-J.

X Found on examination.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
Standard	6,523	45	36.98	122% ± 12
Substandard	31,652	277	168.43	164% ± 7

The company ratings ranged from 165% to 200%.

The death rates from cerebral hemorrhage and organic disease of the heart were each 1¾ times the normal, while Bright's disease was 6½ times the normal. Cancer was low at (½) the normal.

There was a tendency for the mortality to be worse at the younger ages at entry.

From this large but heterogeneous class, 238 dead cases were examined to determine approximately the distribution. They were arranged first by severity and frequency of albumin and separately by type of casts. By comparing the proportions with those shown by the separate classes contributed under albumin and casts respectively, it was possible to estimate not only an average company rating but also what mortality would have been experienced if the hazard were the sum of the separate hazards,—albumin and casts. From these calculations it was inferred that the combination of these two impairments does not require a greater rating than the sum of the separate ratings. The distribution by severity and frequency of albumin was not very different from that in the respective classes of albumin alone. As regards casts, however, not only did one-fourth of the dead cases have granular and epithelial casts (chiefly granular), but also one-fourth of them had two types of casts, such as hyaline and granular, for example. Such cases are presumed to have been excluded from the separate study of casts (611-614) on the ground that they were double impairments. On the other hand, the proportion of cases with constant casts was smaller in this class than in (611-614). Two-thirds of the latter were constant while in the present class 60% were intermittent, 15% constant and 25% were either not specified as to type or found in only one specimen.

(603) with (X1), (Y1), (X2)—Albumin, intermittent, trace.

(X1) Systolic blood pressure 10 Mm. or more under average.

(Y1) Systolic blood pressure 9 Mm. under to 9 Mm. over average.

(X2) Systolic blood pressure 10 Mm. or more over average.

X Found on examination.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
X (X1) Substandard	3,584	20	16.98	118% ± 18
X (Y1) Standard	7,725	33	33.90	97% ± 12
Substandard	19,771	99	80.40	123% ± 9
X (X2) Substandard	7,042	84	37.82	222% ± 16
X (X1), (Y1), (X2)				
Standard	10,036	44	45.91	96% ± 10
Substandard	30,397	203	135.20	150% ± 8

Only 3 and 8 deaths were recorded in the standard sections of (X1) and (X2), respectively.

The company ratings averaged 140%, 130% and 225% for (X1), (Y1) and (X2), respectively. In standard and substandard combined, the corresponding mortality ratios were 99% ± 14, 115% ± 7 and 211% ± 15 for (X1), (Y1) and (X2), respectively.

In (X1) no cause of death was significant. In (Y1), the death rates from tuberculosis of the lungs and suicide were 2 and 3½ times the normal, respectively. In (X2) the death rates from Bright's disease and suicide were 5 and 4½ times the normal, respectively.

(607) with (X1), (Y1), (X2)—Albumin, constant, trace.

(X1) Systolic blood pressure 10 Mm. or more under average.
(Y1) Systolic blood pressure 9 Mm. under to 9 Mm. over average.
(X2) Systolic blood pressure 10 Mm. or more over average.
X Found on examination.

		Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
X (X1)	Standard	2,052	15	8.96	167%±28
	Substandard	6,810	43	27.77	155%±16
X (Y1)	Standard	13,316	53	59.27	89%± 8
	Substandard	39,374	216	154.86	139%± 7
X (X2)	Standard	1,677	12	8.91	134%±25
	Substandard	12,600	174	61.69	282%±14
X (X1), (Y1), (X2)					
	Standard	17,045	80	77.14	104%± 7
	Substandard	58,784	433	244.32	177%± 5

The company ratings averaged 150%, 135% and 235% for (X1), (Y1) and (X2), respectively.

In (X1) the death rate from cancer was 5½ times the normal, while in (Y1) that from Bright's disease was 4 times the normal.

In (X2) the death rates from Bright's disease, pneumonia and organic disease of the heart were 9, 3½ and 3 times the normal, respectively.

There was a tendency towards the best relative mortality at the youngest age-group.

(841) with (X1), (Y1), (X2)—Appearance fragile not robust.

(X1) Systolic blood pressure 10 Mm. or more under average.
(Y1) Systolic blood pressure 9 Mm. under to 9 Mm. over average.
(X2) Systolic blood pressure 10 Mm. or more over average.
X Found on examination.

		Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
X (X1)	Substandard	4,504	34	21.82	156%±17
X (Y1)	Standard	3,580	22	15.23	144%±20
	Substandard	10,181	49	43.38	113%±11
X (X2)	Substandard	1,522	17	8.63	197%±32
X (X1), (Y1), (X2)					
	Standard	5,259	28	23.20	121%±16
	Substandard	16,207	100	73.83	135%± 9

Only 4 and 2 deaths were recorded in the standard sections of (X1) and (X2), respectively.

The company ratings averaged 140%, 140% and 200% for (X1), (Y1) and (X2), respectively. For standard and substandard combined the corresponding mortality ratios were 135%±15, 121%±10 and 187%±28 for (X1), (Y1) and (X2), respectively.

The death rate from tuberculosis of the lungs was 6 times the normal in (X1), while for a combination of all the data it was 4½ times the normal.

Summary of Combinations of Impairments

The principal aim in investigating the mortality among cases with a combination of two impairments is to compare their mortality with that due to the respective single impairments. Classes where the degree of overweight or underweight was in question, and deaf-mutism, appear under the respective impairments. Of the remaining seven combinations, three have been omitted from the tabular summary—aortic regurgitation with high blood pressure because there

were only 14 deaths, albumin with casts and also fragile appearance with high blood pressure because these classes were so heterogeneous. The classes showing other combinations are summarized in the following table, in which substandard data only have been included. In the column headed "Impairments" there are in each class two impairments, opposite each of which there is shown in column (2) the mortality experienced for that single impairment as shown under its numerical position in the text. In column (3) the sum of the extra mortality for these single impairments is formed including 100%, so that it is comparable with the mortality ratio experienced in the combined impairment class, column (4), now under discussion. The difference between these two ratios is shown in the final column, and it is this difference which naturally forms the object of interest in dealing with combinations of impairments.

Code Number	Impairments	Time Code	Average Company Rating for Combination	Mortality Experience for Single Impairment	Sum of Excess Points Experienced Plus 100	Actual Experience for the Combination	Excess of Sum for Single Impairments over Combination (points)
			(1)	(2)	(3)	(4)	(5)
(302) and (344 part)	Apex murmur, systolic, constant, transmitted to left and Blood pressure 15 Mm. or more above average	X	245%	224% ± 4 202% ± 4	326	201% ± 12	+125
(302) and (344 part)	Apex murmur, systolic, constant, transmitted to left and Blood pressure 15 Mm. or more above average	X(G-H)	250%	281% ± 8 202% ± 4	383	279% ± 20	+104
(603) and (344 part)	Albumin, intermittent trace and Blood pressure 10 Mm. or more above average	X	225%	129% ± 6 195% ± 4	224	222% ± 16	+ 2
(607) and (344 part)	Albumin, constant, trace and Blood pressure 10 Mm. or more above average	X	235%	173% ± 5 195% ± 4	268	282% ± 14	— 14

It may be mentioned that the mortality ratio for blood pressure 10 mm. or more above the average was obtained by omitting half of the "overaverage" group from impairment class (344), i. e. half of the group 5 to 15 mm. over average.

All of the four classes here listed dealt with blood pressure above the average. When this impairment was combined with a heart murmur it gave an extra mortality considerably below the sum of the extra mortality for the single impairments. When blood pressure above the average was combined with a trace of albumin, however, the experience was approximately equal to the sum of the extra mortalities of the single impairments.

In the two groups of heart murmur with blood pressure above the average the experience was no higher than that for the murmur alone. This can hardly be explained by careful selection on the part of the company, because when the rating is high the better risks refuse the policies

and thus create a counter-selection. It might be, however, that the tendency for a lessened force of the blood stream due to the leaky valve in the heart was fully compensated by other causes which produced the high blood pressure.

When the experience under the present combinations is compared with the company ratings nothing new is learned which was not intimated under the single impairments. The company ratings were exceeded in the case of heart murmurs and were about right for the various classes of albumin.

The combinations fell naturally into two main groups. The first comprised (302)X and X(G-H) each with (X2), heart impairments with high blood pressure. In this group the death rates from organic disease of the heart and from Bright's disease were 8 and 3 times the normal, respectively. The second group, made up of the data on combinations of albuminuria with blood pressure, was divided into three parts according as the blood pressure was under average, average or over average. The interesting feature of this group was the apparent effect of the varying degree of blood pressure on the mortality ratios of certain causes of death. The death rates from organic disease of the heart, from Bright's disease and from suicide all increased as the relative degree of blood pressure increased. The results are given in the following table:

Ratios of Actual to Expected Deaths from the Given Cause

Cause of Death	(X1) Blood Pressure Under Average	(Y1) Blood Pressure Average	(X2) Blood Pressure Over Average
Organic disease of the heart	36% ± 14	119% ± 12	236% ± 28
Bright's disease	142% ± 34	282% ± 23	737% ± 66
Suicide	52% ± 24	187% ± 22	233% ± 44

On the other hand, the death rates from tuberculosis of the lungs tended to decrease as the blood pressure increased.

APOPLEXY OR PARALYSIS, DIABETES, INSANITY IN FAMILY HISTORY, TWO OR MORE CASES UNDER AGE 60.

These are code numbers (701), (702) and (703). The term "cases" includes records of sickness at time of insured's application as well as deaths, but includes only parents and full brothers and sisters. Some companies also ask for the information regarding grandparents, a custom which twenty years ago was practically always followed, but such information is not included in the present data.

The restriction that the cases must have been at ages under sixty was not made in the M. A. M. I. and therefore the mortality ratio in the present data would be expected to be higher than in the earlier investigation.

(701) Apoplexy or paralysis in family history, two or more cases under age 60.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
Standard	10,296	82	81.02	101%±7

Only three deaths were recorded in the substandard section.

The company ratings averaged 120%.

Apoplexy or paralysis in family history, two or more cases at any age.

One of the companies contributed the following material without differentiating according to age as follows:

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
Standard	18,332	215	200.92	107%±5

A combination of the two standard sections above resulted in a mortality ratio of 105%±4. In the M. A. M. I. a class which included two or more cases of apoplexy or paralysis in the family history at any age showed a mortality ratio of 108%±3. In the Specialized Investigation (1903) a class which was limited to the case of a parent dead below age 70 of apoplexy or paralysis, showed a mortality ratio of 94%±1.

A combination of all the data for causes of death showed that the death rate from cerebral hemorrhage was 2¼ times the normal. In the M. A. M. I. it was twice the normal.

In a representative section of the material there were seven deaths from arterio-sclerosis against less than one expected.

The mortality ratio was higher at the young ages than at the older ages.

The average age at entry for all the data was 46, six years above the general average.

It was recently suggested that a high blood pressure was to be expected under cases with a family history of apoplexy. Accordingly the material of one contributing company was examined from this point of view. The following average or expected systolic blood pressure readings corresponding to those used by the contributing company for standard risks were adopted for comparison:

Ages	Expected Systolic Blood Pressure
10-14	110
15-34	120
35-47	125
48-58	130
59 & over	135

The material was arranged in these age groups to find an expected blood pressure reading which could be compared with the actual reading. Following are the results for all ages grouped together:

Apoplexy or Paralysis in Family History—Average Systolic Blood Pressure Readings (Mm.)

Deaths		Others		Total Number of		Actual Less Expected	
Actual	Expected	Actual	Expected	Deaths	Others	Deaths	Others
129.6	125.5	124.7	123.3	30	859	4.1	1.4

For all cases combined, the actual reading was 124.9 mm. and the expected 123.4 mm. resulting in a difference of 1.5 mm. When it is realized that one millimeter advance represents about two years' difference in age, the relative size of these differences becomes apparent. It is noteworthy that the excess of actual reading over expected was almost three times as great among the dead cases as among the other entrants. This means that the blood pressure was the same as for a life more than eight years older than the true age. For all the data combined, the excess of the actual over the expected blood pressure represents an advance in age of about three years. From the above it appears that there is a definite relationship between a family history of apoplexy or paralysis and high blood pressure and that this fact is particularly outstanding in the group of deaths.

Detail Tables

(701) Apoplexy or paralysis in family history, two or more cases under age 60.

Standard BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	2,942	13	13.99	93
3-5	3,322	17	23.20	73
6-10	2,874	24	27.03	89
11-19	1,158	28	16.80	167
All	10,296	82	81.02	101

Standard BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	1,295	7	4.06	172
30-39	3,229	15	14.76	102
40-49	4,069	31	31.99	97
50 & over	1,703	29	30.21	96
All	10,296	82	81.02	101

Number of deaths by cause (all ages)

Cerebral hemorrhage and apoplexy	9	Cancer and other malignant tumors	8
Pneumonia	9	Average age at entry	42

Apoplexy or paralysis in family history, two or more cases at any age.

Standard BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	4,903	31	29.89	104
3-5	6,029	58	55.21	105
6-10	5,269	79	69.23	114
11-19	2,131	47	46.59	101
All	18,332	215	200.92	107

Standard BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	799	4	2.50	160
30-39	4,262	32	19.32	166
40-49	7,686	81	64.70	125
50 & over	5,585	98	114.40	86
All	18,332	215	200.92	107

Number of deaths by cause (all ages)

Cerebral hemorrhage and apoplexy	37	Nephritis and Bright's disease	21
Organic disease of heart	30	Accident, not war	16
Cancer and other malignant tumors	25	Average age at entry	46

(702) Diabetes in family history, two or more cases under age 60.

No substandard material was submitted in this class and in the standard section there were too few cases to justify giving the results—seven deaths. The company ratings averaged 120%.

Diabetes in family history, two or more cases at any age.

One of the companies contributed the following material without differentiating between cases under age 60 and others.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
Standard	2,002	24	18.24	132%±18

A combination of both the standard sections above resulted in a mortality ratio of 100%±12. In the M. A. M. I. the data were too scanty to arrive at any conclusions.

A combination of all the data for causes of death showed five deaths from diabetes against less than one expected.

The discovery of insulin in 1923 drew attention to the death rate from diabetes, which is higher in the United States than in any other country for which the facts are available. A decrease in the death rate was experienced in the principal combatant nations during the World War. Excessive consumption of food, particularly sugar, is generally regarded as conducive to this disease; the decline is attributed to government restrictions of food. However, since 1910 there has been an increase of at least 25% in the death rate from diabetes in this country.

It is regrettable in view of the general interest in this subject that the material now presented is not more extensive.

(703) Insanity in family history, two or more cases under age 60.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
Standard	2,557	21	17.22	122%±18

There were only two deaths in the substandard section.

The company ratings averaged 135%.

Insanity in family history, two or more cases at any age.

One of the companies contributed the following material without differentiating between cases under age 60 and others.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
Standard	2,624	19	20.21	94%±14

For a combination of both the above sets of standard data, the mortality ratio was 107%±12. For a similar group the M. A. M. I. showed a mortality ratio of 74%±9 and the Specialized Investigation (1903) a mortality ratio of 83%±2.

Two deaths from suicide were recorded.

DETAIL TABLES

DETAIL TABLES

(101, 102, 103, 105) B, C, D, each with (G-J)—Syphilis, other than cured with thorough treatment. One attack within ten years of application.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	4,293	15	13.02	115
3-5	4,052	25	16.88	148
6-10	3,242	32	16.94	189
11-19	1,333	15	9.28	162
All	12,920	87	56.12	155

Number of deaths by cause (all ages)

Accident, not warfare	10	Organic disease of heart	8
Tuberculosis of lungs	10	Average age at entry	35

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	4,957	27	14.86	182
30-39	5,923	34	24.37	140
40-49	1,679	20	11.58	173
50 & over	361	6	5.31	113
All	12,920	87	56.12	155

(101, 102, 103, 105) F (G-J)—Syphilis, other than cured with thorough treatment. One attack over ten years prior to application.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	3,554	16	16.01	100
3-5	3,605	35	23.12	151
6-10	2,777	22	24.14	91
11-19	1,118	31	15.90	195
All	11,054	104	79.17	131

Number of deaths by cause (all ages)

Organic disease of heart	19	Nephritis and Bright's disease	8
Cancer and other malignant tumors	13	Accident, not war	4
Pneumonia	9	Average age at entry	43

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	381	1	1.16	86
30-39	4,579	34	20.22	168
40-49	4,680	53	37.06	143
50 & over	1,414	16	20.73	77
All	11,054	104	79.17	131

(101, 102, 103, 105) B, C, D, F, each with (G-J)—Syphilis, other than cured with thorough treatment. One attack at any time prior to application.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	2,228	15	9.58	157
3-5	2,369	19	14.52	131
6-10	1,920	24	15.75	152
11-19	752	11	8.91	123
All	7,269	69	48.76	142

Number of deaths by cause (all ages)

Nephritis and Bright's disease	9	Accident, not war	6
Organic disease of heart	7	Average age at entry	42

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	1,228	8	3.88	206
30-39	2,916	19	12.41	153
40-49	2,307	32	17.39	184
50 & over	818	10	15.08	66
All	7,269	69	48.76	142

(101, 102, 103, 105) B, C, D, F—(Continued)

Substandard

POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	7,847	31	29.03	107
3-5	7,657	60	40.00	150
6-10	6,019	54	41.08	131
11-19	2,451	46	25.18	183
All	23,974	191	135.29	141

Number of deaths by cause (all ages)

Organic disease of heart	27
Cancer and other malignant tumors	19
Accident, not war	14

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	5,338	28	16.02	175
30-39	10,502	68	44.59	153
40-49	6,359	73	48.64	150
50 & over	1,775	22	26.04	84
All	23,974	191	135.29	141

Pneumonia	14
Nephritis and Bright's disease	13
Average age at entry	39

(104) B, C, D, F—Syphilis, cured, thorough treatment. One attack, at any time prior to application.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	1,619	9	6.53	138
3-5	1,888	15	10.80	139
6-10	1,928	32	14.55	220
11-19	966	14	11.14	126
All	6,401	70	43.02	163

Number of deaths by cause (all ages)

Tuberculosis of lungs	11
Accident, not war	5

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	1,153	8	3.69	217
30-39	2,845	25	13.27	188
40-49	1,722	27	13.41	201
50 & over	681	10	12.65	79
All	6,401	70	43.02	163

Influenza	5
Average age at entry	40

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	7,228	31	28.27	110
3-5	6,566	56	35.34	158
6-10	4,851	52	32.52	160
11-19	1,602	27	14.84	182
All	20,247	166	110.97	150

Number of deaths by cause (all ages)

Cancer and other malignant tumors	28
Accident, not war	17
Pneumonia	17

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	3,002	5	8.98	56
30-39	9,507	70	38.81	180
40-49	6,257	68	43.21	157
50 & over	1,481	23	19.97	115
All	20,247	166	110.97	150

Tuberculosis of lungs	15
Suicide	12
Average age at entry	41

(104) D—Syphilis, cured, thorough treatment. One attack, within 6-10 years of application.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	2,093	8	7.11	113
3-5	1,985	26	9.27	280
6-10	1,617	30	9.82	305
11-19	581	13	4.85	268
All	6,276	77	31.05	248

Number of deaths by cause (all ages)

Cancer and other malignant tumors	15
Tuberculosis of lungs	8

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	1,202	2	3.61	55
30-39	3,370	31	13.49	230
40-49	1,498	35	10.90	321
50 & over	206	9	3.05	295
All	6,276	77	31.05	248

Pneumonia	8
Average age at entry	38

(104) F—Syphilis, cured, thorough treatment. One attack, over 10 years prior to application.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	3,926	17	17.71	96
3-5	3,623	26	22.32	116
6-10	2,525	16	19.43	82
11-19	708	7	7.94	88
All	10,782	66	67.40	98

Number of deaths by cause (all ages)

Accident, not war	9
Cancer and other malignant tumors	9

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	388	..	1.17	..
30-39	4,774	21	19.94	105
40-49	4,378	31	29.75	104
50 & over	1,242	14	16.54	85
All	10,782	66	67.40	98

Appendicitis and typhlitis	8
Average age at entry	43

(111) B-C (Y1)—Rheumatism. One attack, within 5 years of application with no record of operation for removal of tonsils prior to application.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	17,649	65	58.58	111
3-5	18,145	100	83.91	119
6-10	18,689	109	110.62	99
11-19	9,996	139	88.43	157
All	64,479	413	341.54	121

Number of deaths by cause (all ages)

Organic disease of heart	58
Accident, not war	32
Pneumonia	30

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	27,778	122	85.61	143
30-39	21,229	113	94.22	120
40-49	12,249	119	104.35	114
50 & over	3,223	59	57.36	103
All	64,479	413	341.54	121

Influenza	27
Cancer and other malignant tumors	26
Average age at entry	38

(111) B-C (Y1)—(Continued)

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	5,626	31	18.40	168
3-5	4,703	30	21.08	142
6-10	3,229	28	17.57	159
11-19	840	6	7.79	77
All	14,398	95	64.84	147

Number of deaths by cause (all ages)

Organic disease of heart	13
Suicide	11

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	7,110	31	20.52	151
30-39	4,294	22	16.62	132
40-49	2,219	24	15.20	158
50 & over	775	18	12.50	144
All	14,398	95	64.84	147

Influenza	9
Average age at entry	38

(111) D-F (Y1)—Rheumatism. One attack over 5 years prior to application with no record of operation for removal of tonsils prior to application.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	23,949	94	95.58	98
3-5	23,939	150	137.19	109
6-10	20,840	181	162.11	112
11-19	8,621	128	103.61	124
All	77,349	553	498.49	111

Number of deaths by cause (all ages)

Organic disease of heart	74
Nephritis and Bright's disease	53
Cancer and other malignant tumors	45

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	19,824	74	60.44	122
30-39	27,527	130	116.62	111
40-49	21,207	182	167.89	108
50 & over	8,791	167	153.54	109
All	77,349	553	498.49	111

Accident, not war	41
Tuberculosis of lungs	25
Average age at entry	41

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	2,660	15	9.84	152
3-5	2,590	24	13.51	178
6-10	1,691	12	11.83	101
11-19	494	10	5.04	198
All	7,435	61	40.22	152

Number of deaths by cause (all ages)

Organic disease of heart	12
Accident, not war	11

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	2,563	10	7.51	133
30-39	2,520	14	9.89	142
40-49	1,684	19	11.87	160
50 & over	668	18	10.95	164
All	7,435	61	40.22	152

Cancer and other malignant tumors	7
Average age at entry	39

(111) G-H (Y1)—Rheumatism. Two or more attacks within 5 years of application with no record of removal of tonsils prior to application.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	2,121	18	7.92	227
3-5	2,177	14	11.55	121
6-10	2,232	20	15.89	126
11-19	1,217	13	13.46	97
All	7,747	65	48.82	133

Number of deaths by cause (all ages)

Organic disease of heart	13
Accident, not war	9

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	2,590	13	8.03	162
30-39	2,719	20	11.90	168
40-49	1,775	19	15.13	126
50 & over	663	13	13.76	94
All	7,747	65	48.82	133

Influenza	7
Average age at entry	40

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	2,890	20	10.87	184
3-5	2,761	26	14.83	175
6-10	2,184	25	15.67	160
11-19	740	8	7.37	109
All	8,575	79	48.74	162

Number of deaths by cause (all ages)

Nephritis and Bright's disease	9
Organic disease of heart	8

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	2,925	18	8.67	208
3-5	2,810	30	11.58	259
6-10	2,035	20	15.92	126
11-19	805	11	12.57	88
All	8,575	79	48.74	162

Pneumonia	8
Average age at entry	40

(111) J-K (Y1)—Rheumatism. Two or more attacks, over 5 years prior to application with no record of operation for removal of tonsils prior to application.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	2,319	17	9.78	174
3-5	2,382	13	14.51	90
6-10	2,022	25	16.39	153
11-19	759	10	9.98	100
All	7,482	65	50.66	128

Number of deaths by cause (all ages)

Organic disease of heart	14
Nephritis and Bright's disease	6

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	1,439	9	4.34	207
30-39	2,788	18	11.59	155
40-49	2,282	17	18.56	92
50 & over	973	21	16.17	130
All	7,482	65	50.66	128

Accident, not war	4
Average age at entry	42

(111) B-C, D-F, G-H, J-K (Y1)—Rheumatism. One or more attacks at any time prior to application with no record of operation for removal of tonsils prior to application.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	46,038	194	171.86	113
3-5	46,643	277	247.16	112
6-10	43,783	335	305.01	110
11-19	20,593	290	215.48	135
All	157,057	1,096	939.51	117

Number of deaths by cause (all ages)

Organic disease of heart	159
Accident, not war	86
Cancer and other malignant tumors	81

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	51,631	218	158.42	138
30-39	54,263	281	234.33	120
40-49	37,513	337	305.93	110
50 & over	13,650	260	240.83	108
All	157,057	1,096	939.51	117

Nephritis and Bright's disease	78
Pneumonia	75
Average age at entry	39

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	11,724	70	41.07	170
3-5	10,625	85	52.29	163
6-10	7,626	66	48.38	136
11-19	2,247	27	21.83	124
All	32,222	248	163.57	152

Number of deaths by cause (all ages)

Organic disease of heart	38
Accident, not war	22
Influenza	19

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	12,999	60	37.95	158
30-39	10,485	72	41.61	173
40-49	6,380	68	46.40	147
50 & over	2,358	48	37.61	128
All	32,222	248	163.57	152

Tuberculosis of lungs	18
Nephritis and Bright's disease	16
Average age at entry	40

(111) B-C, D-F, G-H, J-K (X1) (Y1)—Rheumatism. One or more attacks at any time prior to application, with or without operation recorded for removal of tonsils prior to application.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	52,040	206	190.41	108
3-5	50,875	293	265.05	111
6-10	45,718	344	315.26	109
11-19	20,938	291	217.76	134
All	169,571	1,134	988.48	115

Number of deaths by cause (all ages)

Organic disease of heart	164
Accident, not war	89
Cancer and other malignant tumors	82

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	57,133	233	173.75	134
30-39	58,726	289	250.12	116
40-49	39,638	345	318.30	108
50 & over	14,074	267	246.31	108
All	169,571	1,134	988.48	115

Pneumonia	80
Nephritis and Bright's disease	80
Average age at entry	40

(111) B-C, D-F, G-H, J-K (X1) (Y1)—(Continued)

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	13,059	79	44.92	176
3-5	11,551	89	55.94	159
6-10	7,974	68	49.95	136
11-19	2,295	27	22.28	121
All	34,879	263	173.09	152

Number of deaths by cause (all ages)

Organic disease of heart	39
Accident, not war	25
Influenza	19
Tuberculosis of lungs	18
Nephritis and Bright's disease	16
Average age at entry	39

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	14,406	67	41.66	161
30-39	11,326	76	44.43	171
40-49	6,733	71	48.73	146
50 & over	2,414	49	38.27	128
All	34,879	263	173.09	152

(141) C, D—Tuberculosis of bone or joint. One attack within 3 to 10 years of application.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	1,662	18	4.68	385
3-5	1,505	29	5.71	508
6-10	966	24	4.59	523
11-19	336	6	2.24	268
All	4,469	77	17.22	447

Number of deaths by cause (all ages)

Tuberculosis of lungs	18
Cancer and other malignant tumors	7
Other tuberculosis	5
Average age at entry	35

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	2,635	34	7.67	443
30-39	1,259	23	4.81	478
40-49	526	17	3.72	457
50 & over	49	3	1.02	294
All	4,469	77	17.22	447

(141) F—Tuberculosis of bone or joint. One attack over 10 years prior to application.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	5,286	19	16.20	117
3-5	5,535	33	22.90	144
6-10	4,324	17	22.55	75
11-19	1,356	8	10.35	77
All	16,501	77	72.00	107

Number of deaths by cause (all ages)

Tuberculosis of lungs	9
Pneumonia	8
Influenza	7
Average age at entry	35

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	7,397	30	22.18	135
30-39	6,361	30	25.58	117
40-49	2,265	9	15.94	56
50 & over	478	8	8.30	96
All	16,501	77	72.00	107

(141) C-F (b)—Tuberculosis of bone or joint. One attack, more than two years prior to application, all weights other than 20% or more underweight.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	6,285	30	18.78	160
3-5	6,379	51	25.85	197
6-10	4,891	34	25.28	134
11-19	1,575	13	11.75	111
All	19,130	128	81.66	157

Number of deaths by cause (all ages)

Tuberculosis of lungs	24
Influenza	11
Cancer and other malignant tumors	9

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	9,373	54	27.92	193
30-39	6,728	46	26.93	171
40-49	2,542	17	17.93	95
50 & over	487	11	8.88	124
All	19,130	128	81.66	157

Accident, not war	8
Pneumonia	8
Average age at entry	35

(141) C-F (a), (b)—Tuberculosis of bone or joint. One attack, more than two years prior to application, all weights.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	6,972	37	20.88	177
3-5	7,090	64	28.69	223
6-10	5,325	41	27.39	150
11-19	1,692	14	12.68	110
All	21,079	156	89.64	174

Number of deaths by cause (all ages)

Tuberculosis of lungs	27
Influenza	11
Pneumonia	11

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	10,086	65	30.05	216
30-39	7,649	54	30.51	177
40-49	2,829	26	19.86	131
50 & over	515	11	9.22	119
All	21,079	156	89.64	174

Accident, not war	10
Cancer and other malignant tumors	9
Average age at entry	35

(222) B-F—Fractured Skull. At any time prior to application.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	5,964	31	19.87	156
3-5	4,774	16	21.52	74
6-10	2,564	4	14.78	27
11-19	595	3	5.53	54
All	13,897	54	61.70	88

Number of deaths by cause (all ages)

Accident, not war	12
Influenza	5

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	5,543	19	15.69	121
30-39	5,033	14	18.61	75
40-49	2,559	10	16.78	60
50 & over	762	11	10.62	104
All	13,897	54	61.70	88

Suicide	5
Average age at entry	38

(253, 254, 257) X-B—Hysteria, Nervousness, Neurasthenia, Nervous Prostration. Found on examination or one attack within two years of application.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	11,852	53	43.48	122
3-5	10,761	85	56.09	152
6-10	8,462	57	60.51	94
11-19	2,793	38	29.52	129
All	33,868	233	189.60	123

Number of deaths by cause (all ages)

Pneumonia	21
Suicide	21
Cancer and other malignant tumors	20

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	10,791	45	32.17	140
30-39	11,942	59	48.44	122
40-49	8,003	84	58.04	145
50 & over	3,132	45	50.95	88
All	33,868	233	189.60	123

Accident, not war	17
Organic disease of heart	15
Average age at entry	39

(253, 254, 257) C-F—Hysteria, Nervousness, Neurasthenia or Nervous Prostration. One attack, more than two years prior to application.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	23,385	89	107.32	83
3-5	21,982	127	146.58	87
6-10	16,182	134	144.41	93
11-19	4,706	72	64.31	112
All	66,255	422	462.62	91

Number of deaths by cause (all ages)

Organic disease of heart	54
Cerebral hemorrhage and apoplexy	45
Pneumonia	42

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	10,619	31	31.94	97
30-39	23,483	94	95.77	98
40-49	21,786	134	162.50	82
50 & over	10,367	163	172.41	95
All	66,255	422	462.62	91

Cancer and other malignant tumors	37
Suicide	33
Average age at entry	42

(253, 254, 257) C-F—(Continued)

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	3,086	16	12.00	133
3-5	2,538	20	13.83	145
6-10	1,635	16	12.28	130
11-19	468	6	6.17	97
All	7,727	58	44.28	131

Number of deaths by cause (all ages)

Tuberculosis of lungs	11
Organic disease of heart	5

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	1,999	10	5.80	172
30-39	2,801	12	10.60	113
40-49	2,147	21	15.32	137
50 & over	780	15	12.56	119
All	7,727	58	44.28	131

Pneumonia	5
Average age at entry	42

(253, 254, 257) X-B, C-F, G-K—Hysteria, Nervousness, Neurasthenia or Nervous Prostration. Found on examination or one or more attacks prior to application.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	36,806	148	158.03	94
3-5	34,219	216	212.81	101
6-10	25,737	201	215.55	93
11-19	7,831	110	99.20	111
All	104,593	675	685.59	98

Number of deaths by cause (all ages)

Organic disease of heart	71
Pneumonia	63
Cancer and other malignant tumors	57
Cerebral hemorrhage and apoplexy	56
Suicide	56
Average age at entry	41

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	22,001	77	65.79	117
30-39	36,958	154	150.25	102
40-49	31,354	232	232.68	100
50 & over	14,280	212	236.87	90
All	104,593	675	685.59	98

(253, 254, 257) X-B, C-F, G-K—(Continued)

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	6,814	44	24.81	177
3-5	5,366	38	27.41	139
6-10	3,511	31	23.94	129
11-19	978	12	10.83	111
All	16,669	125	86.99	144

Number of deaths by cause (all ages)

Tuberculosis of lungs	18
Influenza	9
Pneumonia	8
Nephritis and Bright's disease	8
Accident, not war	7
Average age at entry	40

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	5,244	24	15.01	160
30-39	5,858	37	22.50	164
40-49	4,224	40	29.23	137
50 & over	1,343	24	20.25	119
All	16,669	125	86.99	144

(263) B-F—Paralysis, infantile. One attack at any time prior to application.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	13,258	37	38.91	95
3-5	11,451	47	45.49	103
6-10	7,526	45	37.42	120
11-19	1,909	14	14.42	97
All	34,144	143	136.24	105

Number of deaths by cause (all ages)

Pneumonia	17
Cancer and other malignant tumors	14
Accident, not war	13
Organic disease of heart	13
Tuberculosis of lungs	12
Average age at entry	35

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	19,594	54	56.20	96
30-39	9,499	41	37.07	111
40-49	4,063	37	27.78	133
50 & over	988	11	15.19	72
All	34,144	143	136.24	105

(301) X—Apex murmur, systolic, constant, not transmitted to the left. Found on examination.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	11,330	64	40.23	159
3-5	10,086	72	47.18	153
6-10	7,465	57	45.14	126
11-19	2,062	41	17.19	239
All	30,943	234	149.74	156

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	12,414	61	36.54	167
30-39	10,493	75	41.19	182
40-49	5,899	65	42.02	155
50 & over	2,137	33	29.99	110
All	30,943	234	149.74	156

Number of deaths by cause (all ages)

Organic disease of heart	63	Pneumonia	12
Nephritis and Bright's disease	18	Accident, not war	9
Cancer and other malignant tumors	16	Average age at entry	39

(302) X(X1)—Apex murmur, systolic, constant, transmitted to the left. Found on examination where occupation of insured involves light work.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	38,252	292	129.97	225
3-5	35,258	326	161.76	202
6-10	27,274	355	159.37	223
11-19	6,501	122	51.59	236
All	107,285	1,095	502.69	218

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-19	43,008	316	126.77	249
30-39	38,518	362	152.22	237
40-49	19,489	243	135.92	179
50 & over	6,270	174	87.78	198
All	107,285	1,095	502.69	218

Number of deaths by cause (all ages)

Organic disease of heart	311	Nephritis and Bright's disease	57
Pneumonia	80	Influenza	44
Cancer and other malignant tumors	57	Average age at entry	37

(302) X(Y1)—Apex murmur, systolic, constant, transmitted to the left. Found on examination where occupation of insured involves heavy work.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	4,725	45	14.97	301
3-5	3,818	41	16.05	255
6-10	2,438	43	12.69	339
11-19	368	7	2.68	261
All	11,349	136	46.39	293

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	5,053	53	14.43	367
30-39	4,057	35	15.07	232
40-49	1,829	37	11.35	326
50 & over	410	11	5.54	199
All	11,349	136	46.39	293

Number of deaths by cause (all ages)

Organic disease of heart	39	Nephritis and Bright's disease	9
Pneumonia	11	Influenza	7
Accident, not war	9	Average age at entry	36

(302) XG—Apex murmur, systolic, constant, transmitted to the left. Found on examination with slight hypertrophy.

Substandard BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	15,314	144	52.36	275
3-5	13,567	136	63.71	213
6-10	7,553	92	42.80	215
11-19	1,274	22	9.58	230
All	37,708	394	168.45	234

Substandard BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	14,865	98	42.91	228
30-39	12,853	129	48.42	266
40-49	7,817	109	49.55	220
50 & over	2,173	58	27.57	210
All	37,708	394	168.45	234

Number of deaths by cause (all ages)

Organic disease of heart	115	Nephritis and Bright's disease	22
Pneumonia	33	Cancer and other malignant tumors	18
Influenza	23	Average age at entry	38

(302) XH—Apex murmur, systolic, constant, transmitted to the left. Found on examination with moderate hypertrophy.

Substandard BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	3,500	61	11.94	511
3-5	3,005	68	13.99	486
6-10	2,092	55	11.40	482
11-19	525	12	3.87	310
All	9,122	196	41.20	476

Substandard BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	3,671	46	10.73	429
30-39	3,097	55	12.21	450
40-49	1,907	62	12.66	490
50 & over	447	33	5.60	589
All	9,122	196	41.20	476

Number of deaths by cause (all ages)

Organic disease of heart	65	Tuberculosis of lungs	8
Nephritis and Bright's disease	11	Accident, not war	5
Pneumonia	9	Average age at entry	38

(303) X—Apex murmur, systolic, constant, transmitted to the left with history of rheumatism or other infectious disease. Found on examination.

(Y1) With history of rheumatism without tonsillectomy recorded.

Substandard BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	6,046	62	19.18	323
3-5	5,607	92	23.79	387
6-10	4,872	81	26.45	306
11-19	2,186	52	17.05	305
All	18,711	287	86.47	332

Substandard BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	8,383	112	25.55	438
30-39	6,460	83	26.48	313
40-49	3,239	76	25.00	304
50 & over	629	16	9.44	169
All	18,711	287	86.47	332

Number of deaths by cause (all ages)

Organic disease of heart	99	Nephritis and Bright's disease	10
Pneumonia	29	Accident, not war	8
Influenza	13	Average age at entry	36

(303) X—(Continued)

(Y2) With other infection without tonsillectomy recorded.

Substandard BY POLICY YEAR Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	3,387	16	11.03	145
3-5	3,388	29	15.25	190
6-10	2,371	18	13.49	133
11-19	324	13	2.27	573
All	9,470	76	42.04	181

Substandard BY AGE AT ISSUE Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	4,096	26	11.98	217
30-39	3,308	26	12.46	209
40-49	1,577	23	10.82	213
50 & over	489	1	6.78	15
All	9,470	76	42.04	181

Number of deaths by cause (all ages)

Organic disease of heart	29	Nephritis and Bright's disease	3
Influenza	4	Average age at entry	36

(303) X (G-H)—Apex murmur, systolic, constant, transmitted to the left with history of rheumatism or other infectious disease. Found on examination with slight or moderate hypertrophy.

(Y1) With history of rheumatism without tonsillectomy recorded.

Substandard POLICY YEAR Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	3,043	42	9.97	421
3-5	2,541	46	11.18	411
6-10	1,582	34	8.85	384
11-19	443	16	3.56	449
All	7,609	138	33.56	411

Substandard BY AGE AT ISSUE Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	3,223	43	9.32	461
30-39	2,606	47	9.96	472
40-49	1,396	31	9.21	337
50 & over	384	17	5.07	335
All	7,609	138	33.56	411

Number of deaths by cause (all ages)

Organic disease of heart	64	Typhoid	4
Pneumonia	18	Nephritis and Bright's disease	4
Influenza	5	Average age at entry	38

(303) X, X(G-H)—Apex murmur, systolic, constant, transmitted to the left with history of rheumatism or other infectious disease. Found on examination with or without slight or moderate hypertrophy.

(X1, X2, Y1, Y2)—With history of rheumatism or other infection with or without tonsillectomy recorded.

Substandard BY POLICY YEAR Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	18,125	154	57.33	269
3-5	16,218	206	69.54	296
6-10	10,896	160	58.86	272
11-19	3,179	89	24.38	365
All	48,418	609	210.11	290

Substandard BY AGE AT ISSUE Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	22,116	228	64.57	353
30-39	16,591	193	63.88	302
40-49	7,723	148	53.91	275
50 & over	1,988	40	27.75	144
All	48,418	609	210.11	290

Number of deaths by cause (all ages)

Organic disease of heart	234	Accident, not war	18
Pneumonia	63	Nephritis and Bright's disease	18
Influenza	23	Average age at entry	37

(304) X—Apex murmur, systolic, inconstant. Found on examination.

Substandard BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	3,717	17	12.34	138
3-5	3,451	22	15.44	142
6-10	2,095	11	11.40	96
11-19	540	9	3.83	235
All	9,803	59	43.01	137

Substandard BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	4,156	15	12.23	123
30-39	3,528	18	13.39	134
40-49	1,654	17	10.83	157
50 & over	465	9	6.56	137
All	9,803	59	43.01	137

Number of deaths by cause (all ages)

Organic disease of heart	11	Tuberculosis of lungs	5
Accident, not war	6	Average age at entry	38

(305, 306) X—Apex murmur, systolic, mitral regurgitation not clearly in (301 to 304). Found on examination.

Substandard BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	23,812	166	74.14	224
3-5	24,423	228	101.27	225
6-10	17,892	203	91.29	222
11-19	4,825	43	34.85	123
All	70,952	640	301.55	212

Substandard BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	34,208	238	100.84	236
30-39	24,169	241	97.26	248
40-49	10,271	119	72.28	165
50 & over	2,304	42	31.17	135
All	70,952	640	301.55	212

Number of deaths by cause (all ages)

Organic disease of heart	230	Nephritis and Bright's disease	34
Pneumonia	49	Accident, not war	32
Tuberculosis of lungs	34	Average age at entry	35

(305, 306) XG—Apex murmur, systolic, mitral regurgitation not clearly in (301 to 304). Found on examination with slight hypertrophy.

Substandard BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	4,216	39	13.97	279
3-5	4,183	47	18.62	252
6-10	2,644	27	14.02	193
11-19	678	4	4.37	92
All	11,721	117	50.98	230

Substandard BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	5,213	37	15.36	241
30-39	4,145	36	16.28	221
40-49	1,807	27	11.92	227
50 & over	556	17	7.42	229
All	11,721	117	50.98	230

Number of deaths by cause (all ages)

Organic disease of heart	36	Accident, not war	5
Pneumonia	8	Tuberculosis of lungs	5
Influenza	7	Average age at entry	35

(305, 306) XH—Apex murmur, systolic, mitral regurgitation not clearly in (301 to 304). Found on examination with moderate hypertrophy.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	1,546	18	4.92	366
3-5	1,631	40	7.01	571
6-10	1,171	12	6.14	195
11-19	354	2	2.39	84
All	4,702	72	20.46	352

Number of deaths by cause (all ages)

Organic disease of heart	33
Tuberculosis of lungs	5

Substandard

BY AGE AT ISSUE

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	2,136	22	6.25	352
30-39	1,715	26	6.86	379
40-49	645	13	4.53	287
50 & over	206	11	2.82	390
All	4,702	72	20.46	352

Influenza	4
Average age at entry	35

(307, 308) X, XG—Apex murmur, presystolic or diastolic, constant, mitral obstruction. Found on examination with or without slight hypertrophy.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	1,202	16	3.57	448
3-5	1,021	25	3.94	635
6-10	586	18	2.69	669
11-19	115	2	.84	238
All	2,924	61	11.04	553

Number of deaths by cause (all ages)

Organic disease of heart	21
Pneumonia	3

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	1,351	21	3.81	551
30-39	1,136	25	4.26	587
40-49	403	14	2.61	536
50 & over	34	1	.36	278
All	2,924	61	11.04	553

Nephritis and Bright's disease	3
Average age at entry	34

(310) X—Basic murmur, aortic area, systolic, constant, transmitted upward. Found on examination.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	3,375	33	11.05	299
3-5	3,445	35	15.28	229
6-10	3,207	44	17.37	253
11-19	1,225	22	8.50	259
All	11,252	134	52.20	257

Number of deaths by cause (all ages)

Organic disease of heart	33
Pneumonia	14
Cancer and other malignant tumors	10

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	5,216	27	15.85	170
30-39	3,768	38	15.72	242
40-49	1,772	49	13.28	369
50 & over	496	20	7.35	272
All	11,252	134	52.20	257

Accident, not war	5
Tuberculosis of lungs	5
Average age at entry	36

(310) X(G-H)—Basic murmur, aortic area, systolic, constant, transmitted upward. Found on examination with slight or moderate hypertrophy.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	1,375	16	4.45	360
3-5	1,301	36	5.67	635
6-10	863	21	4.57	460
11-19	255	5	1.63	307
All	3,794	78	16.32	478

Number of deaths by cause (all ages)

Organic disease of heart	30
Pneumonia	6

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	1,782	21	5.33	394
30-39	1,241	24	4.79	501
40-49	624	26	4.27	609
50 & over	147	7	1.93	363
All	3,794	78	16.32	478

Influenza	3
Average age at entry	35

(314, 315) X, XG—Basic murmur, aortic area, diastolic, constant, transmitted downward, aortic regurgitation. Found on examination with slight hypertrophy.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	1,190	12	3.32	361
3-5	992	27	3.63	744
6-10	652	8	2.80	286
11-19	246	4	1.45	276
All	3,080	51	11.20	455

Number of deaths by cause (all ages)

Organic disease of heart	16
Influenza	3

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	1,613	24	4.74	506
30-39	1,155	13	4.29	303
40-49	278	12	1.62	741
50 & over	34	2	.55	364
All	3,080	51	11.20	455

Tuberculosis of lungs	3
Average age at entry	34

(316) X—Basic murmur, pulmonic area, systolic, constant, not transmitted. Found on examination.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	7,196	20	21.51	93
3-5	7,002	32	27.64	116
6-10	4,465	13	21.41	61
11-19	557	..	3.63	..
All	19,220	65	74.19	88

Number of deaths by cause (all ages)

Accident, not war	16
Appendicitis and typhlitis	8

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	9,573	24	27.92	86
30-39	6,824	23	25.08	92
40-49	2,350	16	14.36	111
50 & over	473	2	6.83	29
All	19,220	65	74.19	88

Pneumonia	6
Average age at entry	35

(316) X—(Continued)

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	7,535	25	23.93	104
3-5	7,880	35	33.10	106
6-10	7,280	31	35.95	142
11-19	2,808	13	17.82	73
All	25,503	124	110.80	112

Number of deaths by cause (all ages)

Organic disease of heart	20
Pneumonia	16
Accident, not war	11

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	12,821	34	39.13	87
30-39	8,175	39	34.53	113
40-49	3,636	31	24.78	125
50 & over	871	20	12.36	162
All	25,503	124	110.80	112

Tuberculosis of lungs	9
Cancer and other malignant tumors	9
Average age at entry	34

(326) XG, XH—Hypertrophy of the heart, no murmur. Slight or moderate, found on examination.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	4,106	23	14.86	155
3-5	3,313	34	16.23	209
6-10	1,873	20	11.17	179
11-19	416	8	2.98	268
All	9,708	85	45.24	188

Number of deaths by cause (all ages)

Accident, not war	25
Organic disease of heart	12

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	4,002	16	11.45	140
30-39	3,220	24	11.91	202
40-49	1,669	31	10.89	285
50 & over	787	14	10.99	127
All	9,708	85	45.24	188

Tuberculosis of lungs	4
Average age at entry	39

(330) X—Persistent rapid pulse, 90-100. Found on examination.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	9,963	46	34.32	134
3-5	10,275	75	49.25	152
6-10	10,090	76	62.98	121
11-19	4,572	55	40.25	137
All	34,900	252	186.80	135

Number of deaths by cause (all ages)

Cancer and other malignant tumors	29
Influenza	24
Tuberculosis of lungs	22

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	15,109	76	46.09	165
30-39	11,238	54	48.59	111
40-49	6,238	59	51.00	116
50 & over	2,315	63	41.12	153
All	34,900	252	186.80	135

Pneumonia	20
Organic disease of heart	19
Average age at entry	38

(330) X—(Continued)

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	5,482	33	18.03	183
3-5	4,603	37	21.05	176
6-10	2,868	25	16.74	149
11-19	915	6	7.78	77
All	13,868	101	63.60	159

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	6,137	39	17.62	221
30-39	4,394	28	17.13	163
40-49	2,537	29	17.23	168
50 & over	800	5	11.62	43
All	13,868	101	63.60	159

Number of deaths by cause (all ages)

Tuberculosis of lungs	29	Cancer and other malignant tumors	6
Influenza	7	Nephritis and Bright's disease	6
Organic disease of heart	7	Average age at entry	38

(332) X—Persistent slow pulse, 55-65. Found on examination.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	107,562	314	381.80	82
3-5	106,647	425	523.30	81
6-10	97,966	502	605.70	83
11-19	34,956	222	291.80	76
All	347,131	1,463	1,802.60	81

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	149,747	538	450.57	119
30-39	110,217	335	459.01	73
40-49	62,360	288	468.50	61
50 & over	24,807	302	424.52	71
All	347,131	1,463	1,802.60	81

Number of deaths by cause (all ages)

Accident, not war	193	Tuberculosis of lungs	104
Cancer and other malignant tumors	123	Pneumonia	104
Influenza	116	Average age at entry	38

(332) X—(Continued)

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	6,211	26	20.70	126
3-5	6,611	31	29.18	106
6-10	5,624	24	28.86	83
11-19	1,183	8	7.51	107
All	19,629	89	86.25	103

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	10,145	24	30.10	80
30-39	5,784	21	22.38	94
40-49	2,679	25	18.84	133
50 & over	1,021	19	14.93	127
All	19,629	89	86.25	103

Number of deaths by cause (all ages)

Accident, not war	15	Influenza	8
Pneumonia	10	Average age at entry	35

(334, 335, 336) X—Persistent intermittent pulse, one or more beats dropped per minute. Found on examination.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	3,706	18	14.55	124
3-5	3,762	16	20.61	78
6-10	3,131	27	23.01	117
11-19	1,323	22	13.83	159
All	11,922	83	72.00	115

Number of deaths by cause (all ages)

Organic disease of heart	15
Pneumonia	8

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	3,775	16	11.32	141
30-39	3,914	27	16.20	167
40-49	3,008	21	23.69	89
50 & over	1,225	19	20.79	91
All	11,922	83	72.00	115

Accident, not war	7
Average age at entry	40

(334, 335, 336) X—(Continued)

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	7,609	30	31.50	95
3-5	5,893	47	34.40	137
6-10	2,979	30	23.10	130
11-19	673	9	8.24	109
All	17,154	116	97.24	119

Number of deaths by cause (all ages)

Organic disease of heart	26
Pneumonia	11
Accident, not war	9

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	4,345	16	12.20	131
30-39	5,775	26	21.05	124
40-49	4,720	37	30.79	120
50 & over	2,314	37	33.20	111
All	17,154	116	97.24	119

Cancer and other malignant tumors	9
Nephritis and Bright's disease	9
Average age at entry	43

(337, 338, 339) X—Irregular pulse, one or more per minute. Found on examination.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	3,314	24	13.08	183
3-5	2,593	17	14.02	121
6-10	1,386	17	8.98	189
11-19	349	11	3.63	303
All	7,642	69	39.71	174

Number of deaths by cause (all ages)

Organic disease of heart	20
Accident, not war	4

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	2,426	3	6.87	44
30-39	2,594	17	9.63	177
40-49	1,838	24	12.19	197
50 & over	784	25	11.02	227
All	7,642	69	39.71	174

Cancer and other malignant tumors	4
Average age at entry	40

(344) X (X1)—Arterial tension—abnormal. Found on examination, 5-15 Mm. over the average systolic blood pressure.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	15,311	105	76.49	137
3-5	12,697	153	94.66	162
6-10	6,122	104	65.42	159
11-19	425	9	5.33	169
All	34,555	371	241.90	153

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	6,895	20	19.03	105
30-39	7,518	35	27.04	129
40-49	12,360	140	78.53	178
50 & over	7,782	176	117.30	150
All	34,555	371	241.90	153

Number of deaths by cause (all ages)

Organic disease of heart	57	Accident, not war	31
Cancer and other malignant tumors	34	Pneumonia	28
Cerebral hemorrhage and apoplexy	33	Average age at entry	44

(344) X (Y1)—Arterial tension—abnormal. Found on examination, 16 to 24 Mm. over the average systolic blood pressure.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	12,207	106	74.25	143
3-5	8,945	140	79.37	196
6-10	4,069	124	50.92	244
11-19	349	12	6.95	173
All	25,570	382	211.49	181

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	4,249	10	11.72	85
30-39	4,213	26	14.87	175
40-49	8,190	136	55.54	245
50 & over	8,918	210	129.36	162
All	25,570	382	211.49	181

Number of deaths by cause (all ages)

Cerebral hemorrhage and apoplexy	66	Cancer and other malignant tumors	31
Organic disease of heart	54	Pneumonia	19
Nephritis and Bright's disease	35	Average age at entry	49

(344) X (X2)—Arterial tension—abnormal. Found on examination, 25 or more Mm. over the average systolic blood pressure.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	21,502	216	116.71	185
3-5	16,025	263	124.85	211
6-10	8,073	224	87.10	257
11-19	1,150	47	19.59	240
All	46,750	750	348.25	215

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	7,411	24	20.74	116
30-39	9,368	90	34.89	258
40-49	17,376	298	114.22	261
50 & over	12,595	338	178.40	189
All	46,750	750	348.25	215

Number of deaths by cause (all ages)

Organic disease of heart	125	Cancer and other malignant tumors	62
Cerebral hemorrhage and apoplexy	81	Pneumonia	26
Nephritis and Bright's disease	78	Average age at entry	47

(344) X-(X1), (Y1), (X2)—Arterial tension—abnormal. Found on examination, 5 or more Mm. above the average systolic blood pressure.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	49,020	427	267.45	160
3-5	37,667	556	298.88	186
6-10	18,264	452	203.44	222
11-19	1,924	68	31.87	213
All	106,875	1,503	801.64	187

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	18,555	54	51.49	105
30-39	21,099	151	76.80	197
40-49	37,926	574	248.29	231
50 & over	29,295	724	425.06	170
All	106,875	1,503	801.64	187

Number of deaths by cause (all ages)

Organic disease of heart	236	Cancer and other malignant tumors	127
Cerebral hemorrhage and apoplexy	180	Pneumonia	73
Nephritis and Bright's disease	134	Average age at entry	47

(401-403) C-F (a)—Pulmonary tuberculosis, with or without physical signs, 10% or more underweight. One attack, more than 2 years prior to application.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	3,856	12	14.02	86
3-5	2,670	42	13.90	302
6-10	1,046	14	7.03	199
11-19	224	2	2.32	86
All	7,796	70	37.27	188

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	973	9	2.72	331
30-39	3,806	33	13.41	246
40-49	2,511	25	15.31	163
50 & over	506	3	5.83	51
All	7,796	70	37.27	188

Number of deaths by cause (all ages)

Tuberculosis of lungs	30	Accident, not war	5
Other tuberculosis	10	Average age at entry	40

(401-403) C-F (b)—Pulmonary tuberculosis, with or without physical signs, 9% under to 9% overweight. One attack, more than 2 years prior to application.

Substandard

BY POLICY YEAR

Ages	(1) Exposed toRisk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	7,317	27	24.38	111
3-5	5,075	29	23.67	123
6-10	2,191	31	13.85	224
11-19	381	7	3.55	197
All	14,964	94	65.45	144

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	2,857	14	8.11	193
30-39	7,705	52	27.19	191
40-49	3,832	24	23.19	103
50 & over	570	4	6.96	57
All	14,964	94	65.45	144

Number of deaths by cause (all ages)

Tuberculosis of lungs	36	Influenza	6
Accident, not war	6	Average age at entry	39

(401-403) C-F (a), (b), (c)—Pulmonary tuberculosis, with or without physical signs, all weights. One attack, more than 2 years prior to application.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	12,668	42	43.04	98
3-5	8,748	73	41.91	174
6-10	3,764	47	23.82	197
11-19	750	12	6.84	175
All	25,930	174	115.61	151

Number of deaths by cause (all ages)

Tuberculosis of lungs	67	Accident, not war	11
Other tuberculosis	13	Cancer and other malignant tumors	9
Pneumonia	13	Average age at entry	39

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	4,530	27	12.83	210
30-39	13,403	91	47.51	192
40-49	6,841	49	41.21	119
50 & over	1,156	7	14.06	50
All	25,930	174	115.61	151

(411) X-(a), (b), (c)—(X1), (Y1), (X2)—Lungs unsatisfactory (dullness, prolonged expiration, suspicious apices). Found on examination, all weights and any place of residence.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	2,728	13	10.17	128
3-5	2,125	20	11.62	172
6-10	1,326	22	9.53	231
11-19	403	9	4.03	223
All	6,582	64	35.35	181

Number of deaths by cause (all ages)

Tuberculosis of lungs	19	Organic disease of heart	6
Pneumonia	11	Average age at entry	44

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	1,599	11	4.50	244
30-39	2,663	20	10.29	194
40-49	1,764	17	12.46	136
50 & over	556	16	8.10	198
All	6,582	64	35.35	181

(413, 414) X-C—Asthma, not hay fever, moderate or severe. Found on examination or one attack within five years of application.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	3,987	10	14.54	69
3-5	3,894	28	20.01	140
6-10	3,267	32	21.86	146
11-19	1,196	14	11.58	121
All	12,344	84	67.99	124

Number of deaths by cause (all ages)

Organic disease of heart	18	Tuberculosis of lungs	7
Cerebral hemorrhage and apoplexy	9	Average age at entry	39

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	4,524	23	13.51	170
30-39	4,304	20	17.71	113
40-49	2,437	28	17.80	157
50 & over	1,079	13	18.97	69
All	12,344	84	67.99	124

(413, 414) G-H—Asthma, not hay fever, moderate or severe. Two or more attacks, last within five years of application.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	7,635	34	26.92	126
3-5	7,470	32	36.79	87
6-10	5,561	40	34.16	117
11-19	2,573	22	23.12	95
All	23,239	128	120.99	106

Number of deaths by cause (all ages)

Pneumonia	19
Organic disease of heart	14
Influenza	13

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	8,735	28	26.08	107
30-39	8,516	37	36.18	102
40-49	4,369	36	32.01	112
50 & over	1,619	27	26.72	101
All	23,239	128	120.99	106

Tuberculosis of lungs	9
Cancer and other malignant tumors	8
Average age at entry	39

(413, 414) G-H—(Continued)

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	6,008	54	21.94	246
3-5	5,456	73	26.97	271
6-10	3,921	55	24.41	225
11-19	1,068	14	9.77	143
All	16,453	196	83.09	236

Number of deaths by cause (all ages)

Pneumonia	39
Organic disease of heart	29
Tuberculosis of lungs	22

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	5,880	41	17.13	239
30-39	5,574	49	22.29	220
40-49	3,787	67	26.21	256
50 & over	1,212	39	17.46	223
All	16,453	196	83.09	236

Influenza	14
Accident, not war	13
Average age at entry	40

(413, 414) X-C, G-H—Asthma, not hay fever, moderate or severe. Found on examination, one or more attacks, last within 5 years of application.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	11,622	44	41.46	106
3-5	11,364	60	56.80	106
6-10	8,828	72	56.02	129
11-19	3,769	36	34.70	104
All	35,583	212	188.98	112

Number of deaths by cause (all ages)

Organic disease of heart	32
Pneumonia	25
Tuberculosis of lungs	16

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	13,259	51	39.59	129
30-39	12,820	57	53.89	106
40-49	6,806	64	49.81	128
50 & over	2,698	40	45.69	88
All	35,583	212	188.98	112

Influenza	15
Cancer and other malignant tumors	13
Average age at entry	39

(413, 414) X-C, G-H—(Continued)

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	7,620	71	27.95	254
3-5	6,777	90	33.58	268
6-10	4,671	63	29.03	217
11-19	1,227	14	11.74	119
All	20,295	238	102.30	233

Number of deaths by cause (all ages)

Pneumonia	42
Organic disease of heart	35
Tuberculosis of lungs	27

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	7,082	49	20.53	239
30-39	6,844	60	27.11	221
40-49	4,858	83	33.30	249
50 & over	1,511	46	21.36	215
All	20,295	238	102.30	233

Accident, not war	17
Influenza	17
Average age at entry	40

(418) X-F (a), (b), (c)—Bronchitis, chronic. Found on examination or one attack at any time prior to application, all weights.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	2,771	20	11.31	177
3-5	2,365	21	13.46	156
6-10	1,553	25	11.52	217
11-19	381	6	4.17	144
All	7,070	72	40.46	178

Number of deaths by cause (all ages)

Pneumonia	14
Tuberculosis of lungs	6

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	1,304	9	3.84	234
30-39	2,707	13	10.66	122
40-49	2,303	36	16.07	224
50 & over	756	14	9.89	142
All	7,070	72	40.46	178

Organic disease of heart	6
Average age at entry	41

(425) B-C (X1)—Pleurisy, no details. One attack of less than two weeks duration, within 5 years of application.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	5,215	23	16.27	141
3-5	5,853	44	24.91	177
6-10	5,961	30	32.07	94
11-19	3,062	19	25.46	75
All	20,091	116	98.71	118

Number of deaths by cause (all ages)

Influenza	17
Tuberculosis of lungs	16
Accident, not war	10

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	9,817	37	30.17	123
30-39	6,688	39	29.65	132
40-49	2,805	33	23.24	142
50 & over	781	7	15.65	45
All	20,091	116	98.71	118

Cancer and other malignant tumors	9
Other tuberculosis	7
Average age at entry	35

(425) B-C(Y1)—Pleurisy, no details. One attack with duration of two weeks or more, within 5 years of application.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	4,121	19	12.79	149
3-5	4,575	35	19.64	178
6-10	4,505	35	23.45	149
11-19	2,135	19	15.85	120
All	15,336	108	71.73	151

Number of deaths by cause (all ages)

Tuberculosis of lungs	28
Influenza	11
Pneumonia	8

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	8,177	39	25.04	156
30-39	4,548	31	19.82	156
40-49	2,089	24	17.67	136
50 & over	522	14	9.20	152
All	15,336	108	71.73	151

Appendicitis and typhlitis	7
Accident, not war	6
Average age at entry	36

(425) B-C (Y1)—(Continued)

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	2,969	20	8.19	244
3-5	2,825	32	10.50	305
6-10	1,831	13	8.61	151
11-19	278	2	1.68	119
All	7,903	67	28.98	231

Number of deaths by cause (all ages)

Tuberculosis of lungs	37
Pneumonia	11

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	4,927	40	14.13	283
30-39	2,078	19	7.65	248
40-49	791	6	5.38	112
50 & over	107	2	1.82	110
All	7,903	67	28.98	231

Accident, not war	4
Average age at entry	34

(425) D (X1)—Pleurisy, no details. One attack of less than two weeks duration, within 6-10 years of application.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	2,944	11	9.79	112
3-5	3,309	16	15.53	103
6-10	3,534	22	21.38	103
11-19	1,878	18	16.66	108
All	11,665	67	63.36	106

Number of deaths by cause (all ages)

Pneumonia	9
Cancer and other malignant tumors	6

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	4,962	20	13.51	148
30-39	4,898	16	21.81	73
40-49	1,858	20	14.96	134
50 & over	647	11	13.08	84
All	11,665	67	63.36	106

Organic disease of heart	6
Average age at entry	37

(425) D (Y1)—Pleurisy, no details. One attack with duration of two weeks or more, within 6-10 years of application.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	3,264	14	10.16	138
3-5	3,331	15	14.22	105
6-10	3,328	30	17.50	171
11-19	1,635	11	11.69	94
All	11,558	70	53.57	131

Number of deaths by cause (all ages)

Tuberculosis of lungs	21
Pneumonia	6
Influenza	4
Average age at entry	35

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	5,563	21	17.25	122
30-39	3,932	26	17.07	152
40-49	1,683	18	13.31	135
50 & over	380	5	5.94	84
All	11,558	70	53.57	131

(425) B-C, D-(X1), (Y1)—Pleurisy, no details. One attack, within 10 years of application, attacks of less than two weeks and of two weeks or more.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	15,544	67	49.01	137
3-5	17,068	110	74.30	148
6-10	17,328	117	94.40	124
11-19	8,710	67	69.66	96
All	58,650	361	287.37	126

Number of deaths by cause (all ages)

Tuberculosis of lungs	68
Influenza	35
Pneumonia	29
Accident, not war	23
Organic disease of heart	21
Average age at entry	36

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	27,819	117	85.97	136
30-39	20,066	112	88.35	127
40-49	8,435	95	69.18	137
50 & over	2,330	37	43.87	84
All	58,650	361	287.37	126

(425) B-C, D-(X1), (Y1)—(Continued)

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	5,365	33	14.97	220
3-5	5,070	50	19.24	260
6-10	3,404	28	16.23	173
11-19	513	4	3.01	133
All	14,352	115	53.45	215

Number of deaths by cause (all ages)

Tuberculosis of lungs	53
Pneumonia	15
Accident, not war	6
Other tuberculosis	5
Nephritis and Bright's disease	4
Average age at entry	34

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	8,790	62	25.13	247
30-39	3,915	38	14.69	259
40-49	1,371	11	9.24	119
50 & over	276	4	4.39	91
All	14,352	115	53.45	215

(426) B-D—Pleurisy, dry. One attack within 10 years of application.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	15,336	86	48.36	178
3-5	14,651	102	63.66	160
6-10	9,949	60	55.34	108
11-19	3,109	26	25.58	102
All	43,045	274	192.94	142

Number of deaths by cause (all ages)

Tuberculosis of the lungs	50
Accident, not war	29
Pneumonia	27

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	18,525	96	55.08	174
30-39	16,255	98	62.44	157
40-49	6,485	59	45.03	131
50 & over	1,780	21	30.39	69
All	43,045	274	192.94	142

Influenza	18
Cancer and other malignant tumors	14
Average age at entry	36

(427) B-C—Pleurisy, with effusion. One attack within 5 years of application.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	2,027	12	6.37	188
3-5	1,945	18	8.25	218
6-10	1,491	18	7.65	235
11-19	641	7	4.19	167
All	6,104	55	26.46	208

Number of deaths by cause (all ages)

Tuberculosis of lungs	14
Pneumonia	7

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	3,230	15	9.78	153
30-39	1,924	19	7.76	245
40-49	668	7	4.56	154
50 & over	284	14	4.36	321
All	6,104	55	26.46	208

Accident, not war	6
Average age at entry	35

(427) B-C—(Continued)

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	2,495	20	6.83	293
3-5	2,106	23	7.57	304
6-10	1,280	9	5.72	157
11-19	198	2	1.81	110
All	6,079	54	21.93	246

Number of deaths by cause (all ages)

Tuberculosis of lungs	33
Accident, not war	5

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	3,885	32	11.09	289
30-39	1,642	16	5.95	269
40-49	467	4	3.06	131
50 & over	85	2	1.83	109
All	6,079	54	21.93	246

Influenza	3
Average age at entry	33

(428) B-C, D—Pleurisy, purulent. One attack, within 10 years of application.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	7,340	14	22.11	63
3-5	6,852	28	28.11	100
6-10	4,397	35	24.19	145
11-19	1,608	6	13.08	46
All	20,197	83	87.49	95

Number of deaths by cause (all ages)

Tuberculosis of lungs	16
Accident, not war	11

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	10,785	32	31.65	101
30-39	6,050	22	23.32	94
40-49	2,639	24	20.44	117
50 & over	723	5	12.08	41
All	20,197	83	87.49	95

Influenza	11
Average age at entry	37

(428) B-C, D—(Continued)

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	3,659	12	10.28	117
3-5	3,375	18	12.73	141
6-10	2,008	19	9.44	201
11-19	345	3	2.23	135
All	9,387	52	34.68	150

Number of deaths by cause (all ages)

Tuberculosis of lungs	14
Accident, not war	10

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	6,215	25	17.68	141
30-39	2,228	18	8.13	221
40-49	700	7	4.58	153
50 & over	244	2	4.29	47
All	9,387	52	34.68	150

Influenza	5
Average age at entry	34

(502, 504) B-D—Dyspepsia or indigestion, gastritis. One attack within 10 years of application.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	2,702	14	10.45	134
3-5	2,233	23	12.21	188
6-10	1,539	12	11.23	107
11-19	634	6	7.20	85
All	7,108	55	41.09	134

Number of deaths by cause (all ages)

Cancer and other malignant tumors	7
Organic disease of heart	7

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	2,389	8	6.92	116
30-39	2,604	18	10.50	171
40-49	1,369	12	9.21	130
50 & over	746	17	14.46	118
All	7,108	55	41.09	134

Tuberculosis of lungs	5
Average age at entry	42

(502, 504) G-J—Dyspepsia or indigestion, gastritis. Two or more attacks, last within 10 years of application.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	3,955	30	15.71	191
3-5	3,089	18	17.60	102
6-10	2,158	20	16.96	118
11-19	770	9	9.00	100
All	9,972	77	59.27	130

Number of deaths by cause (all ages)

Accident, not war	8	Appendicitis and typhlitis	6
Cancer and other malignant tumors	8	Average age at entry	42

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	2,149	10	6.29	159
30-39	3,842	17	15.38	111
40-49	2,831	27	19.29	140
50 & over	1,150	23	18.31	126
All	9,972	77	59.27	130

(502, 504) B-D, G-J—Dyspepsia or indigestion, gastritis. One or more attacks, last within 10 years of application.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	6,657	44	26.16	168
3-5	5,322	41	29.81	138
6-10	3,697	32	28.19	114
11-19	1,404	15	16.20	93
All	17,080	132	100.36	132

Number of deaths by cause (all ages)

Cancer and other malignant tumors	15	Tuberculosis of lungs	8
Organic disease of heart	12	Pneumonia	8
Accident, not war	10	Average age at entry	42

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	4,538	18	13.21	136
30-39	6,446	35	25.88	135
40-49	4,200	39	28.50	137
50 & over	1,896	40	32.77	122
All	17,080	132	100.36	132

(506) C, D, G-J—Gastric ulcer, without operation. One attack within 3-10 years, two or more attacks last within 10 years of application.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	2,482	18	11.30	159
3-5	2,113	30	11.82	254
6-10	1,158	10	8.63	116
11-19	205	..	2.08	..
All	6,318	58	33.83	171

Number of deaths by cause (all ages)

Pneumonia	5	Cancer and other malignant tumors	3
Accident, not war	4	Average age at entry	42

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	1,038	3	2.74	109
30-39	2,615	21	9.69	217
40-49	2,004	19	12.85	148
50 & over	661	15	8.55	175
All	6,318	58	33.83	171

(507)—C, D, G-J—Gastric ulcer, with operation. One attack within 3 to 10 years, two or more attacks last within 10 years of application.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	3,942	37	15.74	235
3-5	3,119	38	17.62	216
6-10	1,655	22	11.94	184
11-19	167	..	1.74	..
All	8,883	97	47.04	206

Number of deaths by cause (all ages)

Cancer and other malignant tumors	17	Organic disease of heart	5
Tuberculosis of lungs	8	Average age at entry	42

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	1,212	12	3.37	356
30-39	3,956	38	14.64	260
40-49	2,798	33	17.55	188
50 & over	917	14	11.48	122
All	8,883	97	47.04	206

(520, 521, 526) C—Biliary colic, not clearly coded elsewhere. Gallstones, no operation. Infected gall bladder, no operation. One attack, within 3, 4, 5, years of application.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	1,590	4	7.64	52
3-5	1,654	16	11.88	135
6-10	1,478	21	15.58	135
11-19	605	16	12.45	129
All	5,327	57	47.55	120

Number of deaths by cause (all ages)

Cerebral hemorrhage and apoplexy	11	Pneumonia	7
Organic disease of heart	7	Average age at entry	45

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	541	2	1.60	125
30-39	1,723	8	7.55	106
40-49	2,025	22	16.97	130
50 & over	1,038	25	21.43	117
All	5,327	57	47.55	120

(520, 521, 526) B, C, D, G-J—Biliary colic, not clearly coded elsewhere. Gallstones, no operation. Infected gall bladder, no operation. One or more attacks, last within 10 years of application.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	5,029	26	24.56	106
3-5	5,218	54	37.73	143
6-10	4,681	47	47.40	99
11-19	2,009	33	34.34	96
All	16,937	160	144.03	111

Number of deaths by cause (all ages)

Cerebral hemorrhage and apoplexy	19	Cancer and other malignant tumors	11
Accident, not war	17	Pneumonia	11
Organic disease of heart	15	Average age at entry	44

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	1,957	6	5.91	102
30-39	5,491	29	24.21	120
40-49	6,108	64	50.07	128
50 & over	3,381	61	63.84	96
All	16,937	160	144.03	111

(522, 524) B, C, D—Gallstones, removal of gall bladder, infected gall bladder, removed, no stones. Within 10 years of application.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	6,778	34	32.04	106
3-5	4,861	35	33.06	106
6-10	1,992	11	18.93	58
11-19	317	8	5.40	148
All	13,948	88	89.43	98

Number of deaths by cause (all ages)

Organic disease of heart	12
Accident, not war	8

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	1,202	4	3.34	120
30-39	4,783	13	17.30	75
40-49	5,474	36	34.35	105
50 & over	2,489	35	34.44	102
All	13,948	88	89.43	98

Cancer and other malignant tumors	7
Average age at entry	45

(523, 525) B-D—Gallstones, drainage of gall bladder, infected gall bladder, no stones, drainage. One attack, within 10 years of application.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	5,991	60	29.96	200
3-5	5,535	49	41.13	119
6-10	3,333	39	34.47	113
11-19	780	13	13.35	97
All	15,639	161	118.91	135

Number of deaths by cause (all ages)

Cancer and other malignant tumors	17
Nephritis and Bright's disease	17
Cerebral hemorrhage and apoplexy	14

Standard

BY AGE AT ISSUE

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	1,430	6	4.25	141
30-39	4,992	42	18.59	226
40-49	5,947	50	42.50	118
50 & over	3,340	63	53.57	118
All	15,639	161	118.91	135

Organic disease of heart	14
Accident, not war	11
Average age at entry	45

(537) B-D—Fistula in ano, with operation. Within 10 years of application.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	15,925	65	60.50	107
3-5	16,309	75	88.04	85
6-10	13,351	127	100.77	126
11-19	5,540	73	66.42	110
All	51,125	340	315.73	108

Number of deaths by cause (all ages)

Accident, not war	31
Appendicitis and typhlitis	29
Tuberculosis of lungs	26

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	10,079	43	31.11	138
30-39	22,035	112	94.03	119
40-49	14,286	104	110.47	94
50 & over	4,725	81	80.12	101
All	51,125	340	315.73	108

Cerebral hemorrhage and apoplexy	25
Organic disease of heart	23
Average age at entry	41

(536, 537) X-D—Fistula in ano, with or without operation. Found on examination or within 10 years of application. 19% under to 19% overweight

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	17,704	72	68.23	106
3-5	18,451	89	101.29	88
6-10	15,787	137	120.11	114
11-19	7,273	92	90.79	101
All	59,215	390	380.42	103

Number of deaths by cause (all ages)

Cerebral hemorrhage and apoplexy	33
Tuberculosis of lungs	32
Appendicitis and typhlitis	30

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	11,378	46	35.62	129
30-39	25,235	129	109.58	118
40-49	16,818	122	133.95	91
50 & over	5,784	93	101.27	92
All	59,215	390	380.42	103

Accident, not war	29
Organic disease of heart	28
Average age at entry	40

(536, 537) X-D—Fistula in ano, with or without operation. Found on examination or within 10 years of application. 20% or more overweight

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	2,346	22	8.78	251
3-5	2,379	16	12.79	125
6-10	2,113	36	15.93	226
11-19	902	15	10.08	149
All	7,740	89	47.58	187

Number of deaths by cause (all ages)

Accident, not war	13
Nephritis and Bright's disease	10

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	1,802	6	5.65	106
30-39	3,341	25	14.12	177
40-49	1,982	29	16.26	178
50 & over	615	29	11.55	251
All	7,740	89	47.58	187

Organic disease of heart	7
Average age at entry	41

(546) B, C, D, G-J—Duodenal ulcer, without operation. One or more attacks last within 10 years of application.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	3,100	17	12.20	139
3-5	1,682	17	9.03	188
6-10	501	6	3.44	174
11-19	66	3	.81	370
All	5,349	43	25.48	169

Number of deaths by cause (all ages)

Cancer and other malignant tumors	4
Nephritis and Bright's disease	4

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	718	3	1.85	162
30-39	2,295	11	7.64	144
40-49	1,847	23	10.21	225
50 & over	489	6	5.78	104
All	5,349	43	25.48	169

Warfare	3
Average age at entry	42

(547) B, C, D, G-J—Duodenal ulcer, with operation. One or more attacks, last within 10 years of application.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	2,506	21	10.11	208
3-5	1,792	15	10.74	140
6-10	1,102	14	8.34	168
11-19	173	1	1.71	58
All	5,573	51	30.90	165

Number of deaths by cause (all ages)

Cancer and other malignant tumors	9
Organic disease of heart	4

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	686	6	1.85	324
30-39	2,543	13	9.44	138
40-49	1,664	26	10.54	247
50 & over	680	6	9.07	66
All	5,573	51	30.90	165

Accident, not warfare	3
Average age at entry	43

(603) X—Albumin, intermittent, trace. Found on examination.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	6,507	20	23.58	85
3-5	4,709	30	24.42	123
6-10	2,080	14	14.02	100
11-19	401	1	3.90	26
All	13,697	65	65.92	99

Number of deaths by cause (all ages)

Suicide	11
Cancer and other malignant tumors	10

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	6,384	11	17.71	62
30-39	3,624	16	12.74	126
40-49	2,291	19	14.38	132
50 & over	1,398	19	21.09	90
All	13,697	65	65.92	99

Tuberculosis of lungs	6
Average age at entry	40

(603) X—(Continued)

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	12,216	58	39.63	146
3-5	11,634	63	50.17	126
6-10	8,649	55	44.79	123
11-19	2,493	18	16.06	112
All	34,992	194	150.65	129

Number of deaths by cause (all ages)

Tuberculosis of lungs	24
Pneumonia	23
Nephritis and Bright's disease	19

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	19,291	66	56.60	117
30-39	9,016	43	34.86	123
40-49	4,874	43	33.15	130
50 & over	1,811	42	26.04	161
All	34,992	194	150.65	129

Cancer and other malignant tumors	13
Organic disease of heart	13
Average age at entry	35

(604, 605) X—Albumin, intermittent, moderate or large amount. Found on examination.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	2,998	14	8.53	164
3-5	2,658	15	10.02	150
6-10	1,764	14	8.07	173
11-19	545	10	3.86	259
All	7,965	53	30.48	174

Number of deaths by cause (all ages)

Nephritis and Bright's disease	13
Pneumonia	6

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	5,099	28	14.59	192
30-39	1,879	8	7.52	106
40-49	802	11	5.90	186
50 & over	185	6	2.47	243
All	7,965	53	30.48	174

Tuberculosis of lungs	5
Average age at entry	35

(607) X—Albumin, constant, trace. Found on examination.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	6,902	13	23.08	56
3-5	6,723	43	32.15	134
6-10	3,596	23	21.78	106
11-19	240	2	2.18	92
All	17,461	81	79.19	102

Number of deaths by cause (all ages)

Cancer and other malignant tumors	12
Accident, not war	8

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	8,797	18	24.66	73
30-39	4,564	15	16.74	90
40-49	2,898	30	19.06	157
50 & over	1,202	18	18.73	96
All	17,461	81	79.19	102

Pneumonia	7
Average age at entry	38

(607) X—(Continued)

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	25,491	122	79.01	154
3-5	23,412	172	95.70	180
6-10	16,160	144	79.95	180
11-19	4,866	54	29.20	185
All	69,929	492	283.86	173

Number of deaths by cause (all ages)

Nephritis and Bright's disease	104
Tuberculosis of lungs	51
Organic disease of heart	37

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	40,031	158	115.64	137
30-39	18,168	142	70.13	202
40-49	9,106	122	62.46	195
50 & over	2,624	70	35.63	196
All	69,929	492	283.86	173

Pneumonia	36
Cancer and other malignant tumors	35
Average age at entry	36

(608) X—Albumin, constant, moderate. Found on examination.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	11,279	50	32.26	155
3-5	10,823	72	40.56	178
6-10	6,240	53	29.68	179
11-19	1,941	25	12.75	196
All	30,283	200	115.25	174

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	18,765	64	53.65	119
30-39	7,604	55	29.91	184
40-49	3,271	61	23.10	264
50 & over	643	20	8.59	233
All	30,283	200	115.25	174

Number of deaths by cause (all ages)

Nephritis and Bright's disease	39	Organic disease of heart	14
Accident, not war	20	Pneumonia	14
Tuberculosis of lungs	18	Average age at entry	34

(609) X—Albumin, constant, large amount. Found on examination.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	2,898	12	7.76	155
3-5	2,333	25	7.96	314
6-10	1,257	18	5.18	347
11-19	405	15	2.57	584
All	6,893	70	23.47	298

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	4,865	31	13.54	229
30-39	1,432	26	5.47	475
40-49	520	10	3.62	276
50 & over	76	3	.84	357
All	6,893	70	23.47	298

Number of deaths by cause (all ages)

Nephritis and Bright's disease	26	Tuberculosis of lungs	5
Accident, not war	15	Average age at entry	31

(601-609) X—Albumin, any frequency and any amount, with 30% or more overweight. Found on examination.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	2,700	14	10.52	133
3-5	2,699	32	15.04	213
6-10	1,597	48	10.74	447
11-19	259	16	2.04	784
All	7,255	110	38.34	287

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	1,697	8	4.98	161
30-39	3,141	39	12.09	323
40-49	1,704	41	10.77	381
50 & over	713	22	10.50	210
All	7,255	110	38.34	287

Number of deaths by cause (all ages)

Organic disease of heart	23	Influenza	8
Nephritis and Bright's disease	13	Suicide	6
Cerebral hemorrhage and apoplexy	9	Average age at entry	40

(601-609) B—Albumin, any frequency and any amount. One finding within 2 years of application.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	29,699	137	108.20	127
3-5	31,648	199	160.75	124
6-10	27,321	210	174.99	120
11-19	10,042	95	94.04	101
All	98,710	641	537.98	119

Number of deaths by cause (all ages)

Accident, not war	70
Nephritis and Bright's disease	65
Organic disease of heart	61

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	45,537	143	137.00	104
30-39	28,089	136	115.53	118
40-49	16,430	181	126.60	143
50 & over	8,654	181	158.85	114
All	98,710	641	537.98	119

Pneumonia	47
Cerebral hemorrhage and apoplexy	36
Average age at entry	38

(611, 612, 613, 614) X—Casts, hyaline or granular, intermittent or constant. Found on examination.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	15,854	75	108.65	69
3-5	18,387	172	188.62	91
6-10	15,908	224	232.47	96
11-19	2,287	84	51.40	163
All	52,436	555	581.14	96

Number of deaths by cause (all ages)

Organic disease of heart	86
Cerebral hemorrhage and apoplexy	65
Cancer and other malignant tumors	55

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	2,152	6	6.44	93
30-39	8,867	35	36.59	96
40-49	20,650	146	156.13	94
50 & over	20,767	368	381.98	96
All	52,436	555	581.14	96

Nephritis and Bright's disease	41
Accident, not war	37
Average age at entry	48

(611, 612, 613, 614) X—(Continued)

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	1,405	15	8.33	180
3-5	1,282	17	10.98	155
6-10	994	13	12.79	102
11-19	355	14	6.41	217
All	4,036	59	38.51	153

Number of deaths by cause (all ages)

Pneumonia	7
Nephritis and Bright's disease	7

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	557	4	1.58	253
30-39	877	5	3.95	127
40-49	1,327	18	10.32	174
50 & over	1,275	32	22.66	141
All	4,036	59	38.51	153

Accident, not war	5
Average age at entry	49

(620) X—Glycosuria, not specified, or found in only one specimen. Found on examination.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	13,444	40	57.14	70
3-5	11,642	74	70.95	104
6-10	7,168	66	60.68	109
11-19	2,713	39	33.60	116
All	34,967	219	222.37	98

Number of deaths by cause (all ages)

Organic disease of heart	29
Accident, not war	27
Cancer and other malignant tumors	22

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	8,731	22	25.75	85
30-39	10,885	51	42.26	121
40-49	10,471	84	76.63	110
50 & over	4,880	62	77.73	80
All	34,967	219	222.37	98

Pneumonia	15
Diabetes	13
Average age at entry	43

(620) B—Glycosuria, not specified or found in only one specimen. One finding, within 2 years of application.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	14,883	72	63.87	113
3-5	17,554	114	107.22	106
6-10	14,502	128	116.90	109
11-19	4,678	78	59.09	132
All	51,617	392	347.08	113

Number of deaths by cause (all ages)

Organic disease of heart	49
Cancer and other malignant tumors	39
Accident, not war	29

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	11,551	31	35.20	88
30-39	17,551	66	73.25	90
40-49	15,591	163	121.40	134
50 & over	6,924	132	117.23	113
All	51,617	392	347.08	113

Diabetes	29
Pneumonia	25
Average age at entry	41

(620) X, B—Glycosuria, not specified or found in only one specimen. Found on examination or one finding within 2 years of application.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	28,327	112	121.01	93
3-5	29,196	188	178.17	106
6-10	21,670	194	177.58	109
11-19	7,391	117	92.69	126
All	86,584	611	569.45	107

Number of deaths by cause (all ages)

Organic disease of heart	78
Cancer and other malignant tumors	61
Accident, not war	56

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	20,282	53	60.95	87
30-39	28,436	117	115.51	101
40-49	26,062	247	198.03	125
50 & over	11,804	194	194.96	100
All	86,584	611	569.45	107

Diabetes	42
Pneumonia	40
Average age at entry	42

(623, 624, 626, 627) X, B—Glycosuria, no diet, intermittent or persistent, less than 1% sugar. Found on examination or one finding within 2 years of application.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	7,317	29	30.35	96
3-5	5,129	51	29.27	174
6-10	2,967	29	21.07	138
11-19	798	12	8.01	150
All	16,211	121	88.70	136

Number of deaths by cause (all ages)

Diabetes	19	Pneumonia	8
Cancer and other malignant tumors	14	Accident, not war	7
Organic disease of heart	11	Average age at entry	43

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	3,136	9	8.82	102
30-39	6,222	27	24.01	112
40-49	4,934	57	31.96	178
50 & over	1,919	28	23.91	117
All	16,211	121	88.70	136

(643) B-C—Renal colic, calculus, gravel, without operation. One attack, within 5 years of application.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	11,985	39	50.36	77
3-5	12,010	47	72.41	65
6-10	10,019	68	86.00	79
11-19	3,870	71	55.99	127
All	37,884	225	264.76	85

Number of deaths by cause (all ages)

Cancer and other malignant tumors	30	Organic disease of heart	19
Accident, not war	23	Cerebral hemorrhage and apoplexy	16
Nephritis and Bright's disease	21	Average age at entry	42

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	5,495	20	16.88	118
30-39	15,065	60	64.00	94
40-49	12,269	71	94.01	76
50 & over	5,055	74	89.87	82
All	37,884	225	264.76	85

(643) B-C, D Renal colic, calculus, gravel, without operation. One attack, within 10 years of application.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	5,459	29	21.38	136
3-5	3,938	17	22.15	77
6-10	2,633	20	19.84	101
11-19	720	8	7.99	100
All	12,750	74	71.36	104

Number of deaths by cause (all ages)

Organic disease of heart	10	Accident, not war	6
Pneumonia	7	Average age at entry	43

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	2,679	6	7.81	77
30-39	4,907	24	18.79	128
40-49	3,813	28	25.97	108
50 & over	1,351	16	18.79	85
All	12,750	74	71.36	104

(643) D—Renal colic, calculus, gravel, without operation. One attack, within 6-10 years of application.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	6,801	26	31.93	81
3-5	7,253	47	50.96	92
6-10	6,243	53	62.85	84
11-19	2,626	50	45.08	111
All	22,923	176	190.82	92

Number of deaths by cause (all ages)

Organic disease of heart	30
Cancer and other malignant tumors	19
Cerebral hemorrhage and apoplexy	18
Nephritis and Bright's disease	15
Suicide	11
Average age at entry	44

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	1,446	7	4.46	157
30-39	8,307	28	35.71	78
40-49	9,021	62	72.25	86
50 & over	4,149	79	78.40	101
All	22,923	176	190.82	92

(643) G-J—Renal colic, calculus, gravel, without operation. Two or more attacks, last within 10 years of application.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	3,336	17	15.92	107
3-5	3,464	18	23.36	77
6-10	2,682	46	25.75	179
11-19	984	24	14.85	162
All	10,466	105	79.88	131

Number of deaths by cause (all ages)

Cerebral hemorrhage and apoplexy	15
Cancer and other malignant tumors	13
Organic disease of heart	13
Nephritis and Bright's disease	8
Accident, not war	7
Average age at entry	44

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	1,052	6	3.18	189
30-39	3,744	16	15.85	101
40-49	3,911	42	30.44	138
50 & over	1,759	41	30.41	135
All	10,466	105	79.88	131

(643) B-C, D, G-J—Renal colic, calculus, gravel, without operation. One or more attacks, last within 10 years of application.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	22,122	82	98.21	83
3-5	22,727	112	146.73	76
6-10	18,944	167	174.60	96
11-19	7,480	145	115.92	125
All	71,273	506	535.46	94

Number of deaths by cause (all ages)

Cancer and other malignant tumors	62
Organic disease of heart	62
Cerebral hemorrhage and apoplexy	49
Nephritis and Bright's disease	44
Accident, not war	40
Average age at entry	43

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	7,993	33	24.52	135
30-39	27,116	104	115.56	90
40-49	25,201	175	196.70	89
50 & over	10,963	194	198.68	98
All	71,273	506	535.46	94

(643) B-C, D, G-J—(Continued)

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	8,223	41	32.97	124
3-5	6,136	27	35.40	76
6-10	4,131	33	32.08	103
11-19	1,221	16	13.75	116
All	19,711	117	114.20	102

Number of deaths by cause (all ages)

Organic disease of heart	13	Cancer and other malignant tumors	11
Nephritis and Bright's disease	12	Pneumonia	9
Influenza	11	Average age at entry	42

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	3,651	11	10.57	104
30-39	7,603	33	29.42	112
40-49	6,215	46	42.57	108
50 & over	2,242	27	31.64	85
All	19,711	117	114.20	102

(644) B-C, D, G-J—Renal colic, calculus, gravel, with operation. One or more attacks, last within 10 years of application.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	2,329	13	8.63	151
3-5	1,883	21	9.69	217
6-10	1,082	15	7.09	212
11-19	236	3	2.37	127
All	5,530	52	27.78	187

Number of deaths by cause (all ages)

Nephritis and Bright's disease	6	Other tuberculosis	3
Accident, not war	5	Average age at entry	39

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	1,233	4	3.51	114
30-39	2,416	14	8.92	157
40-49	1,432	23	9.00	256
50 & over	449	11	6.35	173
All	5,530	52	27.78	187

(645) B-J—Nephritis. One attack at any time prior to application, two or more attacks, last within 10 years of application.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	3,497	10	11.87	84
3-5	3,182	20	15.35	130
6-10	2,272	13	14.70	88
11-19	571	4	5.33	75
All	9,522	47	47.25	99

Number of deaths by cause (all ages)

Influenza	6	Accident, not war	5
Organic disease of heart	5	Average age at entry	40

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	4,078	19	11.70	162
30-39	2,998	13	11.63	112
40-49	1,708	7	12.09	58
50 & over	738	8	11.83	68
All	9,522	47	47.25	99

(667) B-C, D—Hysterectomy. Within 10 years of application.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	3,670	19	16.96	112
3-5	3,086	18	20.85	86
6-10	1,532	14	14.79	95
11-19	339	6	6.68	90
All	8,627	57	59.28	96

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	379	4	.99	404
30-39	2,666	15	9.97	150
40-49	4,108	23	27.71	83
50 & over	1,474	15	20.61	73
All	8,627	57	59.28	96

Number of deaths by cause (all ages)

Cancer and other malignant tumors	13	Pneumonia	5
Nephritis and Bright's disease	7	Average age at entry	44

(669) B-C, D—Ovariotomy. Within 10 years of application.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	6,738	21	21.71	97
3-5	5,653	16	25.46	63
6-10	2,869	17	17.21	99
11-19	660	10	7.27	138
All	15,920	64	71.65	89

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	3,785	13	10.80	120
30-39	8,341	35	30.81	114
40-49	3,140	13	20.76	62
50 & over	654	3	9.28	32
All	15,920	64	71.65	89

Number of deaths by cause (all ages)

Cancer and other malignant tumors	7	Accident, not war	5
Pneumonia	6	Average age at entry	38

(801, 802) (a) (b)—Alcohol, immoderate use, averaging 6 times a year (801), or once a month (802). Issues of 1909-1918 and 1919-1927, excluding Canadian policyholders from the latter.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	13,596	68	47.32	144
3-5	13,405	74	66.50	111
6-10	13,242	87	89.49	97
11-19	6,084	60	61.72	97
All	46,327	289	265.03	109

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	13,076	63	40.50	156
30-39	19,081	81	81.86	99
40-49	11,475	107	93.21	115
50 & over	2,695	38	49.46	77
All	46,327	289	265.03	109

Number of deaths by cause (all ages)

Accident, not war	38	Organic disease of heart	23
Suicide	25	Cancer and other malignant tumors	22
Pneumonia	24	Average age at entry	38

(801, 802) (a) (b)—(Continued)

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	9,735	86	35.26	244
3-5	5,970	78	32.82	238
6-10	4,026	42	30.61	137
11-19	1,727	25	19.60	128
All	21,458	231	118.29	195

Number of deaths by cause (all ages)

Pneumonia	29	Influenza	15
Accident, not war	23	Suicide	15
Organic disease of heart	19	Average age at entry	41

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	4,727	28	13.17	213
30-39	8,333	79	32.73	241
40-49	6,776	83	48.83	170
50 & over	1,622	41	23.56	174
All	21,458	231	118.29	195

(804) (a), (b)—Alcohol, immoderate use, lasting 2 or 3 days, not oftener than 3 times a year. Issues of 1909-1918, and 1919-1927, excluding Canadian policyholders from the latter.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	3,815	60	14.29	420
3-5	3,193	64	18.33	349
6-10	2,531	59	20.15	293
11-19	997	35	13.10	267
All	10,536	218	65.87	331

Number of deaths by cause (all ages)

Nephritis and Bright's disease	24	Accident, not war	21
Organic disease of heart	23	Cerebral hemorrhage and apoplexy	19
Pneumonia	22	Average age at entry	41

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	1,949	11	5.74	192
30-39	4,116	79	17.00	465
40-49	3,384	94	25.71	366
50 & over	1,087	34	17.42	195
All	10,536	218	65.87	331

(806) (a), (b)—Alcohol, steady free user, never intoxicated. Issues of 1909-1918, and 1919-1927, excluding Canadian policyholders from the latter.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	125,504	521	486.33	107
3-5	149,698	997	830.87	120
6-10	189,078	1,734	1439.02	120
11-19	118,622	1,509	1369.33	110
All	582,902	4,761	4125.55	115

Number of deaths by cause (all ages)

Cancer and other malignant tumors	491	Pneumonia	338
Accident, not war	437	Cerebral hemorrhage and apoplexy	315
Organic disease of heart	422	Average age at entry	39

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	148,696	650	485.98	134
30-39	229,362	1,373	1095.40	125
40-49	150,379	1,503	1392.19	108
50 & over	54,465	1,235	1151.98	107
All	582,902	4,761	4125.55	115

(811) X-F—Amputation, leg above knee. At any time prior to application.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	3,311	12	11.74	102
3-5	2,826	21	14.05	149
6-10	1,931	8	12.60	63
11-19	527	6	4.76	126
All	8,595	47	43.15	109

Number of deaths by cause (all ages)

Tuberculosis of lungs	6	Influenza	4
Suicide	6	Average age at entry	39

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	3,107	12	9.11	132
30-39	3,040	12	11.89	101
40-49	1,849	16	12.66	126
50 & over	599	7	9.49	74
All	8,595	47	43.15	109

(821) X—Blindness, one eye. Found on examination.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	18,769	82	70.21	117
3-5	12,962	81	69.01	117
6-10	9,590	71	66.57	107
11-19	2,675	22	26.03	85
All	43,996	256	231.82	110

Number of deaths by cause (all ages)

Accident, not war	37	Cerebral hemorrhage and apoplexy	18
Cancer and other malignant tumors	29	Organic disease of heart	14
Tuberculosis of lungs	21	Average age at entry	42

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	14,631	47	42.38	111
30-39	15,360	71	57.95	123
40-49	9,517	52	62.79	83
50 & over	4,488	86	68.70	125
All	43,996	256	231.82	110

(834) X—Deafness, marked or total. Found on examination.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	14,443	72	61.32	117
3-5	13,106	80	80.78	99
6-10	10,985	95	96.31	99
11-19	4,485	52	63.75	82
All	43,019	299	302.16	99

Number of deaths by cause (all ages)

Cancer and other malignant tumors	30	Accident, not war	26
Organic disease of heart	29	Nephritis and Bright's disease	21
Pneumonia	29	Average age at entry	43

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	10,597	33	31.62	104
30-39	14,080	58	58.68	99
40-49	12,344	91	97.90	93
50 & over	5,998	117	113.96	103
All	43,019	299	302.16	99

(834) X—(Continued)

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	6,105	33	26.32	125
3-5	5,307	50	31.98	156
6-10	3,319	29	25.30	115
11-19	762	6	9.16	66
All	15,493	118	92.76	127

Number of deaths by cause (all ages)

Accident, not war	14	Influenza	8
Cerebral hemorrhage and apoplexy	14	Cancer and other malignant tumors	8
Organic disease of heart	9	Average age at entry	42

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	4,974	23	14.40	160
30-39	4,371	28	16.80	167
40-49	3,998	29	27.86	104
50 & over	2,150	38	33.70	113
All	15,493	118	92.76	127

(841) X (a)—Appearance fragile, not robust. Found on examination, 10% or more underweight.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	7,431	36	24.40	148
3-5	6,833	51	30.92	165
6-10	5,411	41	31.46	130
11-19	1,833	29	15.63	186
All	21,508	157	102.41	153

Number of deaths by cause (all ages)

Tuberculosis of lungs	43	Organic disease of heart	9
Pneumonia	19	Nephritis and Bright's disease	8
Cancer and other malignant tumors	14	Average age at entry	37

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	8,756	41	25.91	158
30-39	7,595	51	30.84	165
40-49	4,043	40	28.63	140
50 & over	1,114	25	17.03	147
All	21,508	157	102.41	153

(841) X (a), (b)—Appearance fragile, not robust. Found on examination. All underweights and others 9% or less overweight.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	2,739	21	8.88	236
3-5	2,352	13	10.76	121
6-10	1,681	16	9.44	169
11-19	514	5	3.47	144
All	7,286	55	32.55	169

Number of deaths by cause (all ages)

Tuberculosis of lungs	11	Organic disease of heart	7
Cancer and other malignant tumors	7	Average age at entry	38

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	3,439	18	10.20	176
30-39	2,192	13	8.40	155
40-49	1,292	18	8.85	203
50 & over	363	6	5.10	118
All	7,286	55	32.55	169

(860) X (a)—Abdomen 2¼ to 3 inches greater than chest expanded. Found on examination, 0-29% overweight.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	1,664	8	8.02	100
3-5	1,693	18	11.54	156
6-10	1,609	25	14.27	175
11-19	687	10	9.50	105
All	5,653	61	43.33	141

Number of deaths by cause (all ages)

Cancer and other malignant tumors	8
Organic disease of heart	8

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	1,185	6	3.52	170
30-39	1,565	8	6.90	116
40-49	1,880	20	15.22	131
50 & over	1,023	27	17.69	153
All	5,653	61	43.33	141

Nephritis and Bright's disease	8
Average age at entry	43

(860) X (a)—(Continued)

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	1,523	12	9.02	133
3-5	1,553	21	13.61	154
6-10	1,274	37	16.13	229
11-19	389	6	7.83	77
All	4,739	76	46.59	163

Number of deaths by cause (all ages)

Organic disease of heart	17
Nephritis and Bright's disease	15

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	266	2	.81	247
30-39	880	7	3.79	185
40-49	2,176	40	17.57	228
50 & over	1,417	27	24.42	111
All	4,739	76	46.59	163

Pneumonia	5
Average age at entry	47

(860) X (b)—Abdomen 2¼ to 3 inches greater than chest expanded. Found on examination, 30-39% overweight.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	1,233	10	6.15	163
3-5	1,263	11	9.33	118
6-10	963	26	9.93	262
11-19	340	10	5.45	183
All	3,799	57	30.86	185

Number of deaths by cause (all ages)

Organic disease of heart	8
Cancer and other malignant tumors	5

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	271	1	.76	132
30-39	1,049	10	4.49	223
40-49	1,788	27	14.09	192
50 & over	691	19	11.52	165
All	3,799	57	30.86	185

Cerebral hemorrhage and apoplexy	4
Average age at entry	44

(860) X (c)—Abdomen 2¼ to 3 inches greater than chest expanded. Found on examination, 40% or more overweight.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	1,234	11	4.80	229
3-5	1,201	13	6.52	199
6-10	899	16	6.49	247
11-19	282	10	3.03	330
All	3,616	50	20.84	240

Number of deaths by cause (all ages)

Organic disease of heart	9
Influenza	7

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	575	3	1.67	180
30-39	1,501	18	6.19	291
40-49	1,259	15	9.15	164
50 & over	281	14	3.83	366
All	3,616	50	20.84	240

Nephritis and Bright's disease	6
Average age at entry	40

(860) X (a), (b), (c)—Abdomen 2¼ to 3 inches greater than chest expanded. Found on examination, all degrees of overweight.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	1,902	8	9.31	86
3-5	1,985	24	13.82	174
6-10	1,975	26	18.37	142
11-19	928	11	14.18	78
All	6,790	69	55.68	124

Number of deaths by cause (all ages)

Cancer and other malignant tumors	10
Organic disease of heart	8

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	1,337	7	3.97	176
30-39	1,856	8	8.20	98
40-49	2,237	23	18.80	122
50 & over	1,360	31	24.71	125
All	6,790	69	55.68	124

Pneumonia	8
Average age at entry	44

(860) X (a), (b), (c)—(Continued)

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	3,990	33	19.97	165
3-5	4,017	45	29.46	153
6-10	3,136	79	32.55	243
11-19	1,011	26	16.31	159
All	12,154	183	98.29	186

Number of deaths by cause (all ages)

Organic disease of heart	34
Nephritis and Bright's disease	24
Cancer and other malignant tumors	11

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	1,112	6	3.24	185
30-39	3,430	35	14.47	242
40-49	5,223	82	40.81	201
50 & over	2,389	60	39.77	151
All	12,154	183	98.29	186

Pneumonia	10
Accident, not war	8
Average age at entry	44

(861) X (a), (b), (c)—Abdomen over 3 inches greater than chest expanded. Found on examination, all degrees of overweight.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	2,172	27	10.61	254
3-5	1,981	23	13.69	168
6-10	1,448	28	13.56	206
11-19	388	21	5.41	388
All	5,989	99	43.27	229

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	497	1	1.29	78
30-39	1,854	12	7.52	160
40-49	2,474	46	18.03	255
50 & over	1,164	40	16.43	243
All	5,989	99	43.27	229

Number of deaths by cause (all ages)

Nephritis and Bright's disease	14	Cancer and other malignant tumors	12
Cerebral hemorrhage and apoplexy	13	Average age at entry	45

(872) (X-F)—Simple goitre, without operation. Found on examination or one attack at any time prior to application. Size of goitre not specified.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	16,289	31	49.89	62
3-5	14,315	61	59.45	103
6-10	7,796	28	40.26	70
11-19	1,798	16	12.75	125
All	40,198	136	162.35	84

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	20,579	46	58.99	78
30-39	12,644	38	46.46	82
40-49	5,571	37	35.82	103
50 & over	1,404	15	21.08	71
All	40,198	136	162.35	84

Number of deaths by cause (all ages)

Accident, not war	19	Suicide	11
Appendicitis and typhlitis	15	Tuberculosis of lungs	10
Influenza	11	Average age at entry	36

(872) (X-F) G—Simple goitre, without operation. Found on examination or one attack at any time prior to application. Small goitre.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	21,599	55	63.16	87
3-5	17,762	62	69.60	89
6-10	7,892	28	38.19	73
11-19	1,658	11	11.30	97
All	48,911	156	182.25	86

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	28,308	63	79.51	79
30-39	13,799	43	49.30	87
40-49	5,461	34	34.12	100
50 & over	1,343	16	19.32	83
All	48,911	156	182.25	86

Number of deaths by cause (all ages)

Accident, not war	22	Suicide	10
Pneumonia	18	Influenza	7
Tuberculosis of lungs	11	Average age at entry	34

(872) (X-F) G—(Continued)

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	10,628	32	30.03	107
3-5	9,508	43	34.84	123
6-10	4,337	12	18.97	63
11-19	854	5	5.34	94
All	25,327	92	89.18	103

Number of deaths by cause (all ages)

Accident, not war	12
Pneumonia	10

Substandard

BY AGE AT ISSUE

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	16,572	57	46.82	122
30-39	6,012	19	22.07	86
40-49	2,260	13	13.76	94
50 & over	483	3	6.53	46
All	25,327	92	89.18	103

Tuberculosis of lungs	9
Average age at entry	33

(872) (X-F), (X-F) G, (X-F) H—Simple goitre, without operation. Found on examination or one attack at any time prior to application. Size not specified, small or medium sized goitre.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	41,542	90	124.86	72
3-5	35,446	144	144.14	100
6-10	17,098	62	86.48	72
11-19	3,609	30	25.23	119
All	97,695	326	380.71	86

Number of deaths by cause (all ages)

Accident, not war	46
Appendicitis and typhlitis	30
Tuberculosis of lungs	24

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	52,956	119	149.95	79
30-39	29,045	97	104.82	93
40-49	12,486	76	78.83	96
50 & over	3,208	34	47.11	72
All	97,695	326	380.71	86

Pneumonia	24
Suicide	21
Average age at entry	35

(872) (X-F), (X-F) G, (X-F) H—(Continued)

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	19,752	55	57.21	96
3-5	17,467	67	66.36	101
6-10	8,385	35	38.82	90
11-19	1,762	9	11.94	75
All	47,366	166	174.33	95

Number of deaths by cause (all ages)

Accident, not war	17
Pneumonia	15
Tuberculosis of lungs	13

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	29,083	86	82.33	104
30-39	12,014	37	44.29	84
40-49	5,170	33	33.13	100
50 & over	1,099	10	14.58	69
All	47,366	166	174.33	95

Cancer and other malignant tumors	13
Organic disease of heart	8
Average age at entry	34

(873) B, C, D-F each with G-J—Simple goitre, with operation. One attack, at any time prior to application.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	5,924	24	20.49	117
3-5	4,658	28	22.29	126
6-10	1,952	19	11.72	162
11-19	312	5	2.74	182
All	12,846	76	57.24	133

Number of deaths by cause (all ages)

Cancer and other malignant tumors	11	Organic disease of heart	9
Accident, not war	9	Average age at entry	39

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	4,735	14	13.35	105
30-39	4,650	16	16.50	97
40-49	2,602	22	15.41	143
50 & over	859	24	11.98	200
All	12,846	76	57.24	133

(885) X-F—Spinal curvature. Found on examination, or one attack at any time prior to application.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	4,438	23	15.97	144
3-5	4,436	29	21.94	132
6-10	3,791	18	22.77	79
11-19	1,588	9	14.10	64
All	14,253	79	74.78	106

Number of deaths by cause (all ages)

Accident, not war	8	Influenza	7
Pneumonia	8	Average age at entry	39

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	5,492	19	16.77	113
30-39	5,098	22	21.74	101
40-49	2,707	23	20.34	113
50 & over	956	15	15.93	94
All	14,253	79	74.78	106

(885) X-F—(Continued)

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1-2	5,953	33	18.71	176
3-5	5,712	50	24.36	205
6-10	3,922	26	20.95	124
11-19	1,006	8	8.43	95
All	16,593	117	72.45	161

Number of deaths by cause (all ages)

Organic disease of heart	18	Cancer and other malignant tumors	7
Pneumonia	17	Other tuberculosis	6
Influenza	8	Average age at entry	35

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29	7,594	33	22.39	147
30-39	5,740	39	21.89	178
40-49	2,601	35	18.02	194
50 & over	658	10	10.15	99
All	16,593	117	72.45	161

Combinations

(302) with (X2) X—Apex murmur, systolic, constant, transmitted to the left (302) with systolic blood pressure, 15 or more Mm. above the average for the age (X2). Found on examination.

Substandard	BY POLICY YEAR (1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
Years				
1-2	4,947	31	17.56	177
3-5	4,580	45	21.83	206
6-10	3,673	41	22.51	182
11-19	608	18	5.26	342
All	13,808	135	67.16	201

Substandard	BY AGE AT ISSUE (1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
Ages				
15-29	5,420	31	15.81	196
30-39	4,265	35	16.81	208
40-49	3,182	44	21.00	210
50 & over	991	25	13.54	185
All	13,808	135	67.16	201

Number of deaths by cause (all ages)

Organic disease of heart	27	Accident, not war	6
Nephritis and Bright's disease	11	Influenza	5
Cancer and other malignant tumors	9	Average age at entry	39

(302) with G-H with (X2) X—Apex murmur, systolic, constant, transmitted to the left with slight or moderate hypertrophy (302 with G-H) with systolic blood pressure, 15 or more Mm. above the average for the age (X2). Found on examination.

Substandard	BY POLICY YEAR (1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
Years				
1-2	2,880	33	10.22	323
3-5	2,559	35	12.66	276
6-10	1,461	22	8.49	259
11-19	213	2	1.55	129
All	7,113	92	32.92	279

Substandard	BY AGE AT ISSUE (1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
Ages				
15-29	2,895	16	8.36	191
30-39	2,075	17	7.73	220
40-49	1,640	29	10.35	280
50 & over	503	30	6.48	463
All	7,113	92	32.92	279

Number of deaths by cause (all ages)

Organic disease of heart	38	Nephritis and Bright's disease	6
Accident, not war	6	Average age at entry	38

(601-609) X with (610-616) X with G-J—Albumin, any amount or frequency (601-609), with 1-10 casts, hyaline, granular or epithelial, any frequency. Found on examination.

Substandard	BY POLICY YEAR (1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
Years				
1-2	12,876	80	47.58	168
3-5	11,086	92	57.08	161
6-10	5,935	75	42.30	177
11-19	1,755	30	21.47	140
All	31,652	277	168.43	164

Substandard	BY AGE AT ISSUE (1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
Ages				
15-29	10,441	53	29.52	180
30-39	10,324	70	39.60	177
40-49	8,100	100	57.89	173
50 & over	2,787	54	41.42	130
All	31,652	277	168.43	164

Number of deaths by cause (all ages)

Nephritis and Bright's disease	75	Cerebral hemorrhage and apoplexy	14
Organic disease of heart	28	Influenza	12
Accident, not war	21	Average age at entry	40

Combinations—Continued

(603) with (Y1) X—Albumin, intermittent, trace (603) with systolic blood pressure, 9 Mm. under to 9 over average (Y1). Found on examination.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	7,496	34	23.65	144
3-5	7,193	42	30.20	139
6-10	4,425	19	22.84	83
11-19	657	4	3.71	108
All	19,771	99	80.40	123

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	10,949	33	31.51	105
30-39	5,252	27	19.23	140
40-49	2,627	21	16.59	127
50 & over	943	18	13.07	138
All	19,771	99	80.40	123

Number of deaths by cause (all ages)

Tuberculosis of lungs	16	Nephritis and Bright's disease	8
Pneumonia	16	Average age at entry	36

(603) with (X2) X—Albumin, intermittent, trace (603) with systolic blood pressure 10 Mm. or more over average (X2). Found on examination.

Substandard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	2,542	22	10.23	215
3-5	2,279	25	12.22	205
6-10	1,812	32	11.81	271
11-19	409	5	3.56	140
All	7,042	84	37.82	222

Substandard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	2,850	10	8.38	119
30-39	1,662	20	6.52	307
40-49	1,738	24	11.75	204
50 & over	792	30	11.17	269
All	7,042	84	37.82	222

Number of deaths by cause (all ages)

Nephritis and Bright's disease	14	Organic disease of heart	6
Cerebral hemorrhage and apoplexy	6	Average age at entry	40

(607) with (Y1) X—Albumin, constant, trace (607), with systolic blood pressure 9 Mm. under to 9 over average (Y1). Found on examination.

Standard

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	5,052	8	16.59	48
3-5	5,076	27	23.75	114
6-10	3,002	15	17.47	86
11-19	186	3	1.46	205
All	13,316	53	59.27	89

Standard

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	6,859	14	19.42	72
30-39	3,669	13	13.56	96
40-49	1,921	15	12.50	120
50 & over	867	11	13.79	80
All	13,316	53	59.27	89

Number of deaths by cause (all ages)

Accident, not war	7	Tuberculosis of lungs	4
Suicide	6	Average age at entry	38

Combinations—Continued

(607) with (Y1) X—(Continued)

Substandard BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	15,760	64	48.16	133
3-5	14,217	76	57.58	132
6-10	8,212	64	41.56	154
11-19	1,185	12	7.56	159
All	39,374	216	154.86	139

Substandard BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	21,773	73	61.35	119
30-39	11,013	54	40.35	134
40-49	5,115	58	33.10	175
50 & over	1,473	31	20.06	155
All	39,374	216	154.86	139

Number of deaths by cause (all ages)

Nephritis and Bright's disease	43	Organic disease of heart	17
Tuberculosis of lungs	24	Cancer and other malignant tumors	12
Accident, not war	19	Average age at entry	35

(607) with (X2) X—Albumin, constant, trace (607), with systolic blood pressure 10 Mm. or more over average (X2). Found on examination.

Substandard BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	4,506	44	16.34	269
3-5	4,229	67	20.77	323
6-10	3,108	49	18.67	262
11-19	757	14	5.91	237
All	12,600	174	61.69	282

Substandard BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	5,811	29	16.96	171
30-39	3,052	52	12.23	425
40-49	2,779	54	19.94	271
50 & over	958	39	12.56	311
All	12,600	174	61.69	282

Number of deaths by cause (all ages)

Nephritis and Bright's disease	38	Pneumonia	13
Cancer and other malignant tumors	14	Tuberculosis of lungs	9
Organic disease of heart	14	Average age at entry	39

(841) with (X1), (Y1), (X2) X—Appearance fragile, not robust (841) with any systolic blood pressure. Found on examination.

Substandard BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
1-2	6,663	38	22.57	168
3-5	5,623	36	26.14	138
6-10	3,438	17	20.99	81
11-19	483	9	4.13	218
All	16,207	100	73.83	135

Substandard BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2)÷(3)
15-29	6,459	28	18.25	153
30-39	5,308	23	19.44	118
40-49	3,363	30	21.31	141
50 & over	1,077	19	14.83	128
All	16,207	100	73.83	135

Number of deaths by cause (all ages)

Tuberculosis of lungs	30	Organic disease of heart	6
Cancer and other malignant tumors	11	Influenza	3
Pneumonia	8	Average age at entry	38

TABLES OF HEIGHT AND WEIGHT

In Volume I of the Medico-Actuarial Mortality Investigation a survey of the literature of anthropometrics was given, including comparisons with the build in other countries, notably England, Germany, Italy and Japan. In recent years a number of papers have been published dealing chiefly with height and weight of students. So far as has been observed, no paper of importance, with two exceptions, has dealt with insured lives along the lines covered by the Medico-Actuarial Mortality Investigation and it was deemed advisable to make such new studies, particularly as they could be readily prepared in connection with the mortality investigation according to build. While such a table might not be expected to show marked changes in height and weight, it would at least serve to support the results there shown. Mention may be made of the Seven Offices table published in 1923 by Mr. A. Levine (T. F. A. IX p. 304 and J. I. A. LIV p. 213). This was based on data for 28,697 men examined during the years 1921 and 1922. The average weights were usually a few pounds lower than in the M. A. M. I. In 1919 Mr. L. P. Orr presented (T. F. A. VIII p. 138) a table of average weights by height and age based on 18,000 examinations of men accepted as standard lives during the years 1881 to 1915. The weights at the principal heights and insuring ages were consistently about two pounds less than those of the M. A. M. I.

Standard risks only for issues of 1909 to 1927 were taken. The material furnished was equally divided among policies issued in summer and in winter in order to allow for the difference in the weight of clothing worn by the insured. The men usually wore coat and vest when being weighed although sometimes the coat was removed.

From the perforated cards a record was made for each five-age group and each inch of height showing the number of cases and the aggregate weight. From this the average weights were obtained to the nearest pound. The grading was accomplished in the following manner;—first, two tables were formed, one by smoothing the differences with regard to age, the other by smoothing the differences with regard to height. The mean of these tables was compared with the ungraded average weights and the differences graded by summation in threes across and down. These differences were then applied to the mean table, giving the final graded weights at each five-age group and each inch of height.

Throughout the work groups of less than ten cases were regarded as too small to form a satisfactory average unless several of them tended to confirm one another. Groups of less than fifty cases were given special attention.

As was the case in the M. A. M. I., the average weights at five feet were generally greater than at 5′ 1″ and even 5′ 2″. They were discarded on the ground of probable misstatement of the facts.

In age groups 10 to 14 and 15 to 19, the differences from the results for ages 20 and over were so great that other material was studied with special care. It was found that the ungraded material of the Medico-Actuarial Mortality Investigation corresponded closely with that of the present investigation, but, in grading, the increases by height and age group had been smoothed out to conform with the increases in the mass of data at ages 20 and over. The new material at ages 10 to 14 tended to confirm the characteristics of the ungraded at ages 15 to 19. Since both the Medico-Actuarial Mortality Investigation ungraded material and the data of this investigation showed marked differences between the weight at ages under 20 and at ages 20 and over, these differences were retained in the graduated weights. Valuable assistance in verifying the graduation was obtained from the recent statistics of the United States Public Health Service (1929)* and the similar results of a pioneer study reported by the State Board of Health of Massachusetts (1876).**

*"Physical Measurements of Boys and Girls . . ." by S. D. Collins & T. Clark.

**"The Growth of Children" by Dr. H. P. Bowditch.

The following table shows the differences of graded average weight from those published in the M. A. M. I. The variation is slight:

Excess of Graded Average Weights in 1929 Study over Graded Average Weights in M. A. M. I.

Males

Age Group	5′-0″	5′-2″	5′-4″	5′-6″	5′-8″	5′-10″	6′-0″	6′-2″	6′-4″
15-19	−3	−2	0	0	0	0	0	0	0
20-24	−1	0	0	0	0	0	0	0	0
25-29	+1	3	2	1	1	1	−1	−2	−2
30-34	2	3	2	1	0	0	−1	−2	−2
35-39	4	4	2	1	0	−1	−2	−4	−2
40-44	3	2	2	1	0	−1	−2	−3	−3
45-49	2	2	0	0	0	+1	−2	−4	−4
50-54	2	2	1	0	1	2	−1	−1	−1

Females

Age Group	4′-8″	4′-10″	5′-0″	5′-2″	5′-4″	5′-6″	5′-8″	5′-10″	6′-0″
15-19	−4	−3	−3	−2	−2	−2	−2	−1	−3
20-24	0	0	0	0	0	0	0	0	−1
25-29	0	0	0	+1	0	0	0	0	0
30-34	+2	+2	+2	2	+1	0	0	0	+1
35-39	1	1	1	1	0	−1	−1	−2	1
40-44	0	0	0	0	0	−1	−1	−1	0
45-49	0	0	0	0	−1	−3	−2	−2	−1
50-54	1	1	1	0	−1	−2	−3	−2	−1

For heights from 5′ 4″ to 6′ 0″ inclusive which covers practically all of the data, there was no deviation greater than two pounds for males or three pounds for females and in the entire range of data there was none greater than four pounds. The greatest deviation for males is in the 5′ 0″ group which varies for all age groups and in the females in the age group 15 to 19 which varies for all heights.

While tables are given in the present study for ages 10 to 14, they were not given in the M. A. M. I. and consequently were not compared in the above table. A large volume of data was available, however, in the present investigation for this age group.

The results of these tables were such that new tables of heights and weights are not presented except at ages under 20 where the new data are available. A vast amount of labor would be occasioned by the adoption of new tables of height and weight. In more than half the cases the number of pounds in the reported weight ends in zero or five as was noted in the M. A. M. I., thus indicating that many weights were estimated. Likewise three-fifths of the heights recorded were at a number of inches divisible by two, which was a distinctly higher proportion than in the M. A. M. I., thus indicating a corresponding tendency to estimate the heights. This is partly accounted for by the use of the rule in 1925 and later that half inches are carried to the nearest even inch. The statistics are sufficiently numerous to prevent any material loss of accuracy and the result sufficiently close to the M. A. M. I. to indicate that little would be gained by the adoption of a new table of height and weight.

As in the M. A. M. I., it was found that the weight for men at ages above 50 to 54 was practically the same as for that age group. For women the same was true, although the data were not numerous above age 54.

Average Heights

The average height of males, taken in their shoes was found in the M. A. M. I. to be slightly over 5′ 8½″. In determining a corresponding figure from the present data, it was necessary to allow for the fact that all standard risks were included at ages under 20 but only 2% at ages 20 and above. The average height after adjustment was 5′ 8″. Parenthetically, it might be mentioned that out of 667,000 cases, 382,000 were for ages under 20. These showed an average height of 5′ 7¾″, while the remaining 285,000 cases at ages 20 and over showed an average height of 5′ 8¼″.

The average height of females, taken in their shoes, was found in the M. A. M. I. to be 5′ 4¼″. In determining a corresponding figure from the present data it was again necessary to allow for the fact that all standard risks were included at ages under 20 but only 2% at ages 20 and above. The average height after adjustment was 5′ 4¼″. Likewise, it might be mentioned that out of 85,000 cases, 50,000 were for ages under 20. These showed an average height of 5′ 4″ while the remaining 35,000 cases at ages 20 and over showed an average height of 5′ 4½″.

Short and Tall Persons

The very short and very tall males present special features. This is particularly noticeable for short persons at the younger ages. Thus for males in 226 cases at heights 3′ 3″ to 4′ 1″ in the age group 10 to 14, the average weight was 67 pounds, while among 1,517 cases at the next three inches of height the average was 66. Similarly among 165 males ranging in height from 3′ 10″ to 4′ 7″ at age 15 to 19 the average weight was three pounds greater than in a large group with a height of 4′ 8″ to 4′ 10″. Those below 4′ 6″ in height (2,844 in number) and less than 20 years old show little difference in average weight as the height varies. The same tendency was also noticeable among 122 men aged from 20 to 64 with a height of less than 5′. This is probably largely a result of selection, since other statistics show that this would not be a characteristic of the population as a whole. Such a large amount of corroborative evidence could not have been caused by errors of perforation or transcription.

For extremely tall males there was a tendency towards a decrease in the average weight as the height increased, although there were only 123 cases at heights above 6′ 5″ as compared with 26 cases in the M. A. M. I. For males at these heights it seemed desirable to assume the standard weight to be that for height 6′ 5″.

There were only 53 cases of females over 6′ 0″ in height and their average weight was the same as for 6′ 0″ so that for heights above 6′ it was deemed desirable to assume the average weight to be for that height.

For the extension below 5′ in height for those aged less than 20 an endeavor has been made to show the weight in the general population rather than the insured lives only. The latter tended to be heavier among the shortest of males probably on account of a careful selection by the companies.

For males and females the material in detail for ages less than 20 and the deviation of graded average weights from the M. A. M. I. at all ages are shown in the tables following this section of the report. The graded weights for ages 10 to 24 are also shown; ages 20 to 22 grade into the M. A. M. I. and weights for ages 23 and 24 are unchanged.

Differences from Previous Investigation

It will be instructive to see how the differences of the new data from those recorded in the former investigation compare with the standard deviations of the four ranges of weights illustrated in the M. A. M. I. (Volume I, page 17). These standard deviations have been calculated by the usual statistical methods and found to be respectively 12, 17, 18 and 21 pounds. It will be seen, therefore, that the differences in the above table, at ages 20 and above, are relatively

quite small and even the maximum range of the differences from the highest to the lowest is less than the standard deviation in the most compact group of readings. The two sets of material may reasonably be considered as representative of the same set of facts. The differences of the present table from the M. A. M. I. table are, upon the whole, only about one-twelfth as great as those which distinguish a table of best-weights (lowest mortality) from one showing average weights. For convenience the average weights derived in the M. A. M. I. are reprinted at the end of this section.

Variation by Sex

The tendency for males to vary over a greater range than in the case of females is interestingly illustrated by the extremes of build to be found in the male table. Thus in the age group 10 to 14 one male was 3′ 3″ in height and weighed 68, another 6′ 6″ and weighed 140, while a third was 6′ 1″ and weighed 188 pounds. The greatest height at any age was 7′ 0″ with a weight of 185 pounds, and the greatest average weight for any group was 223 pounds for those 6′ 7″. All of these males, it may be remembered, were accepted as standard risks from the mortality point of view.

Comparison of Results for Males and Females

As a test of the graduations a comparison was made of the weight of females with that of males at the same age and height. This is a subject which has caused considerable discussion, especially in recent years, and a brief statement of the findings from a very large volume of material may be of interest. The following table shows the excess of weight for males at typical groups of the new data:

Excess of Weight in Pounds for Males over that for Females (1929 Tables)

Ages	HEIGHT 4′-0″	4′-4″	4′-8″	5′-0″	5′-4″	5′-8″	6′-0″
10-14	−2	−1	−1	−2	+2	+4	
15-19			−6	+1	3	4	6
20-24				3	5	5	7
30-34				6	6	6	10
40-44				7	5	5	10
50-54				3	3	4	7

In considering this table it may be remembered that the heights were measured with shoes and the weights included clothing. A table has been prepared dealing with this point (see succeeding page).

It may be interesting to see how the excess of weight for males compares with what it was in the investigation of twenty years ago.

Excess Weight in Pounds for Males (1929) less Excess in M. A. M. I.

Ages	HEIGHT 5′-0″	5′-4″	5′-8″	6′-0″
15-19	0	+2	2	3
20-24	−1	0	0	1
25-29	+1	2	1	−1
30-34	0	1	0	−2
35-39	3	2	1	−3
40-44	3	2	1	−2
45-49	2	1	2	−1
50-54	1	2	4	0

Each age-group is given in order to record the smoothness of the results which involve four graded tables. This slight increase in relative weight for males may be due to the lighter weight of female apparel, which has changed considerably since 1896, the central year in the M. A. M. I.

Professor C. M. Jackson of the Institute of Anatomy, University of Minnesota has pointed out (*) that if the apparent heights of the females recorded in the M. A. M. I. are reduced one inch, to correct for their higher shoe heels, and a further correction is made for the relatively heavier weight of the male clothing, the actual body-weight of the males might be somewhat below that of the females. This test has been applied to the new data. Five pounds have been used to represent the excess weight of male clothing except at ages under 20, where three pounds were used. At those ages the difference in shoe heights was also modified,—½ inch at ages 15 to 19 and no difference at ages 10 to 14. The following table shows the results:

Excess Weight for Females over that for Males, after adjustments, 1929 Tables in Pounds

Ages	HEIGHT								
	4′-0″	4′-3″	4′-6″	4′-9″	5′-0″	5′-3″	5′-6″	5′-9″	6 -0″
10-14	5	4	4	5	5	2	0		
15-19			12	9	3	3	1	1	−1
20-24					4	4	3	4	+2
30-34					1	2	3	2	0
40-44					1	4	4	3	0
50-54					4	6	6	5	2

This table serves to confirm the findings of Martin (1928) and Bardeen (1920)†, quoted by Jackson, who have shown that relatively greater weight for females is a general characteristic in nearly all races, ages and statures; when no adjustment is made in males the weight for a given height is greater than in females at ages 20 and above, whereas the reverse is true after adjustment. It is generally believed that at the age of puberty girls tend to weigh more than boys of the same age, and this tendency is reflected in both tables. In the M. A. M. I. it was pointed out that after a female becomes of age, she increases in weight more rapidly than a male. This is clearly shown in the above table, where the figures tend to increase after ages 20-24.

Reduction in Average Height of Males

In making statistical investigations, comparisons must always be made with the results of previous researches in order to determine whether they correspond, and if they differ, a good reason for the change. Wherever there is a difference, or a change which cannot be explained, it is desirable to check the new data for errors, to obtain additional material or to divide the present data into groups. In all investigations which have been made by this Committee a condition of this sort has generally arisen. In the present investigation the Committee were confronted by the fact that the average height was slightly less than the corresponding figures at the same ages in the M. A. M. I., whereas the general impression was that the height would be somewhat greater. In a study, for example, of the sons of Harvard graduates** it was found that they were on the average 1⅓ inches taller than their fathers were at an age one year older, and that their weight was 8 pounds greater. This condition is generally accepted as applying to both males and females of the middle and upper classes. It was, therefore, necessary in view

*American Journal of Physical Anthropology 12 (3) 1929.

†Martin, R. 1928 Lehrbuch der Anthropologie 2te Aufl. 1 Bd Somatologie. G. Fisher, Jena.
Bardeen, C. R. 1920. Height-weight index of build, etc. Carnegie Inst. Washington. Contrib. to Embryol. No. 46 IX 483-554.

**Harvard College Physical Examinations by Mr. Gordon T. Bowles at the Peabody Museum.

of the lower average height in the recent material, to find some explanation for this apparent anomaly. The first thought which occurred to us was that there might be a larger proportion of the industrial classes in the new material than in the M. A. M. I. and that they were generally shorter and of lighter weight than those with more material comforts and financial means. That such a build relation held in the case of children was shown by Dr. Bowditch in the paper referred to on page 136. In the material for the M.A.M.I. which covers the issues from 1885 to 1908, the contribution of the Metropolitan and Prudential was very small, whereas nearly 30% of the new data came from these two companies. Accordingly, the material of these two companies for males has been prepared, combined and compared with the data which have already been summarized. The results, at first, did not seem to substantiate the theory, as the average height at all ages was practically the same as that of the entire data, while the average weight by height and age shows only small variations with no uniform, significant trend. When ages less than 20 were omitted, however, the average height of 115,000 cases from the two industrial companies was found to be $^{36}/_{100}$ of an inch less than that for all companies. The average height for the new data excluding the two companies was $^{7}/_{100}$ of an inch greater than that of the M. A. M. I. This difference is yet considerably less than that shown by the Harvard data. Further consideration may therefore be useful in harmonizing the new facts with the old.

The great extension of life insurance during the last fifteen years has probably resulted in bringing its benefits to a larger proportion of the industrial and semi-skilled classes, including the stocks which have migrated here from the countries in the southern part of Europe. The Harvard University data, on the other hand, were generally from the older American stock. Another point of view may be presented, namely, that since the M. A. M. I. showed excessive mortality among tall men they may have been selected with greater care than the short men, thus artificially reducing the average height in the new data. If this were so, one would expect to find that the reduction in height was not uniform at all heights, but more pronounced among the tall men. Examination of the two sets of data shows this result:—at ages 20 and over the increase in the number of tall men was only 22% while the increase in the number of short men was 60%. This difference is too great to have been caused entirely by the reduction in average age, which has also occurred. The most probable solution of this problem would seem to be found in a combination of these causes,—(a) more lives of South European origin, (b) artificial selection among tall men, (c) general reduction in age of insured lives.

HEIGHT AND WEIGHT—MALES

Height	Age Group 10-14			Age Group 15-19		
	Number	Aggregate Weight	Average Weight	Number	Aggregate Weight	Average Weight
3′- 3″	1	68	68			
3′- 4″	1	54	54			
3′- 5″	1	61	61			
3′- 6″	2	125	63			
3′- 7″	1	90	90			
3′- 8″	6	396	66			
3′- 9″	1	65	65			
3′-10″	9	645	72	1	81	81
3′-11″	17	1,162	68			
4′- 0″	90	6,278	70	4	382	96
4′- 1″	97	6,258	65	5	463	93
4′- 2″	298	19,009	64	6	540	90
4′- 3″	374	24,701	66	7	713	102
4′- 4″	845	56,621	67	17	1,845	109
4′- 5″	1,035	72,370	70	26	2,870	110
4′- 6″	1,668	121,250	73	43	3,997	93
4′- 7″	1,468	110,880	76	56	4,967	89
4′- 8″	2,152	169,491	79	133	12,402	93
4′- 9″	1,790	146,593	82	192	17,608	92
4′-10″	2,245	192,589	86	552	51,754	94
4′-11″	1,751	157,038	90	622	59,574	96
5′- 0″	2,235	211,181	94	2,652	285,968	108
5′- 1″	1,527	151,266	99	2,679	288,349	108
5′- 2″	1,638	169,658	104	6,290	708,611	113
5′- 3″	1,070	116,537	109	8,101	953,695	118
5′- 4″	1,211	136,738	113	19,127	2,351,688	123
5′- 5″	710	84,424	119	21,287	2,715,590	128
5′- 6″	815	99,171	122	45,052	5,960,254	132
5′- 7″	444	56,913	128	41,803	5,706,420	137
5′- 8″	363	48,319	133	62,386	8,777,110	141
5′- 9″	169	23,079	137	41,148	5,958,238	145
5′-10″	147	20,328	138	46,573	6,934,268	149
5′-11″	64	9,223	144	26,707	4,100,460	154
6′ 0″	12	1,832	153	20,093	3,176,315	158
6′- 1″	2	366	183	6,699	1,088,637	163
6′- 2″	6	1,005	168	3,930	655,932	167
6′- 3″				893	152,942	171
6′- 4″				417	73,885	177
6′- 5″				58	10,610	183
6′- 6″	1	140	140	40	7,187	180
6′- 7″				7	1,134	162
6′- 8″				2	296	148

HEIGHT AND WEIGHT—FEMALES

Height	Age Group 10-14			Age Group 15-19		
	Number	Aggregate Weight	Average Weight	Number	Aggregate Weight	Average Weight
3′- 4″	1	55	55			
3′- 5″				1	100	100
3′- 6″	2	147	74			
3′- 7″						
3′- 8″	3	173	58			
3′- 9″	1	55	55			
3′-10″	6	395	66			
3′-11″	10	566	57	1	100	100
4′- 0″	31	2,040	66	2	210	105
4′- 1″	41	2,467	60	4	377	94
4′- 2″	94	5,811	62	3	309	103
4′- 3″	125	8,025	64	6	647	108
4′- 4″	244	16,527	68	8	868	109
4′- 5″	281	19,145	68	7	692	99
4′- 6″	447	32,330	72	15	1,644	110
4′- 7″	370	28,003	76	13	1,299	100
4′- 8″	525	41,032	78	28	2,634	94
4′- 9″	426	35,210	83	62	6,401	103
4′-10″	524	45,251	86	210	21,791	104
4′-11″	415	37,565	91	383	40,468	106
5′- 0″	603	57,733	96	1,678	184,345	110
5′- 1″	475	47,993	101	2,125	237,116	112
5′- 2″	595	62,109	104	5,446	625,010	115
5′- 3″	468	51,195	109	5,591	660,538	118
5′- 4″	381	43,406	114	8,731	1,063,302	122
5′- 5″	229	27,303	119	6,142	768,657	125
5′- 6″	143	17,169	120	6,518	839,320	129
5′- 7″	70	8,678	124	3,073	407,436	133
5′- 8″	44	5,811	132	2,205	302,235	137
5′- 9″	11	1,488	135	733	103,274	141
5′-10″	11	1,507	137	395	57,200	145
5′-11″	4	508	127	92	14,032	153
6′- 0″	1	150	150	62	9,206	148
6′- 1″				10	1,615	162
6′- 2″				3	501	167
6′- 3″				1	181	181
6′- 4″				2	286	143
6′- 5″				1	135	135
6′- 6″				1	154	154

HEIGHT AND WEIGHT—MALES AND FEMALES
Age Groups 10-14 and 15-19

Height	Ungraded Average Weights				Height	Graded Average Weights			
	Boys		Girls			Boys		Girls	
	10-14	15-19	10-14	15-19		10-14	15-19	10-14	15-19
3′- 3″	68								
3′- 4″	54		55						
3′- 5″	61			100					
3′- 6″	63		74						
3′- 7″	90								
3′- 8″	66		58						
3′- 9″	65		55						
3′-10″	72	81	66						
3′-11″	68		57	100					
4′- 0″	70	96	66	105	4′- 0″	55		57	
4′- 1″	65	93	60	94	4′- 1″	58		59	
4′- 2″	64	90	62	103	4′- 2″	61		62	
4′- 3″	66	102	64	108	4′- 3″	64		65	
4′- 4″	67	109	68	109	4′- 4″	67		68	
4′- 5″	70	110	68	99	4′- 5″	70		71	
4′- 6″	73	93	72	110	4′- 6″	73	86	74	94
4′- 7″	76	89	76	100	4′- 7″	76	90	77	97
4′- 8″	79	93	78	94	4′- 8″	79	94	80	100
4′- 9″	82	92	83	103	4′- 9″	82	98	84	103
4′-10″	86	94	86	104	4′-10″	86	102	88	105
4′-11″	90	96	91	106	4′-11″	90	106	92	107
5′- 0″	94	108	96	110	5′- 0″	94	110	96	109
5′- 1″	99	108	101	112	5′- 1″	99	113	100	112
5′- 2″	104	113	104	115	5′- 2″	104	116	104	115
5′- 3″	109	118	109	118	5′- 3″	109	120	108	118
5′- 4″	113	123	114	122	5′- 4″	114	124	112	121
5′- 5″	119	128	119	125	5′- 5″	119	128	116	124
5′- 6″	122	132	120	129	5′- 6″	123	132	120	128
5′- 7″	128	137	124	133	5′- 7″	128	136	124	132
5′- 8″	133	141	132	137	5′- 8″	132	140	128	136
5′- 9″	137	145	135	141	5′- 9″	136	144		140
5′-10″	138	149	137	145	5′-10″	140	148		144
5′-11″	144	154	127	153	5′-11″	145	153		148
6′- 0″	153	158	150	148	6′- 0″	150	158		152
6′- 1″	183	163		162	6′- 1″		163		
6′- 2″	168	167		167	6′- 2″		168		
6′- 3″		171		181	6′- 3″		173		
6′- 4″		177		143	6′- 4″		178		
6′- 5″		183		135	6′- 5″		183		
6′- 6″	140	180		154					
6′- 7″		162							
6′- 8″		148							

HEIGHT AND WEIGHT—MALES
Graded Average Weight

Age	4′-0″	4′-1″	4′-2″	4′-3″	4′-4″	4′-5″	4′-6″	4′-7″	4′-8″	4′-9″	4 -10″	4′-11″
10	55	57	59	62	65	68	71	74	77	80	84	88
11	55	57	60	63	66	69	72	75	78	81	85	89
12	55	58	61	64	67	70	73	76	79	82	86	90
13	56	59	62	66	69	72	75	78	81	84	88	92
14	57	60	63	67	70	74	77	80	83	87	91	95
15							79	82	86	90	94	98
16							82	85	89	93	97	101
17							84	88	92	96	100	104
18							86	90	94	98	102	106
19							88	92	96	100	104	108

Age	5′-0″	5′-1″	5′-2″	5′-3″	5′-4″	5′-5″	5′-6″	5′-7″	5′-8″	5′-9″	5′-10″	5′-11″
10	92	97	102	107	112	117	121	126	130	134	138	143
11	93	98	103	108	113	118	122	127	131	135	139	144
12	94	99	104	109	114	119	123	128	132	136	140	145
13	96	101	106	110	115	120	124	129	133	137	141	146
14	99	103	108	112	116	121	125	130	134	138	142	147
15	102	106	110	114	118	122	126	131	135	139	143	148
16	105	109	112	116	120	124	128	132	136	140	144	149
17	108	111	114	118	122	126	130	134	138	142	146	151
18	110	113	116	120	124	128	132	136	140	144	148	153
19	112	115	118	122	126	130	134	138	142	146	150	155
20	114	117	120	124	128	132	136	140	144	148	152	156
21	116	119	122	126	130	134	138	142	145	149	153	157
22	118	121	124	127	131	135	139	143	146	150	154	158
23	120	122	125	128	132	136	140	143	147	151	155	159
24	121	123	126	129	133	137	141	144	148	152	156	160

Age	6′-0″	6′-1″	6′-2″	6′-3″	6′-4″	6′-5″
10	148					
11	149					
12	150					
13	151					
14	152					
15	153	158	163	168	173	178
16	154	159	164	169	174	179
17	156	161	166	171	176	181
18	158	163	168	173	178	183
19	160	165	170	175	180	185
20	161	166	171	176	181	186
21	162	167	172	177	182	187
22	163	168	173	178	183	188
23	164	169	175	180	185	190
24	165	171	177	182	187	192

HEIGHT AND WEIGHT—FEMALES

Graded Average Weight

Age	4′-0″	4′-1″	4′-2″	4′-3″	4′-4″	4′-5″	4′-6″	4′-7″	4′-8″	4′-9″	4′-10″	4′-11″
10	56	58	61	64	67	70	73	76	79	82	85	89
11	56	58	61	64	67	70	73	77	80	83	86	90
12	57	59	62	65	68	71	74	77	80	84	88	92
13	58	60	63	66	69	72	75	78	82	86	90	94
14	60	62	65	68	71	74	77	80	84	88	92	96
15							80	83	87	91	95	99
16							84	87	91	95	99	102
17							89	92	96	99	102	105
18							94	97	100	103	105	107
19							98	101	103	105	107	109
20							101	103	105	107	109	111
21							104	105	106	108	110	112
22							105	106	107	109	111	113
23							106	107	108	110	112	114
24							107	108	109	111	113	115

Age	5′-0′	5′-1″	5′-2″	5′-3″	5′-4″	5′-5″	5′-6″	5′-7″	5′-8″	5′-9″	5′-10″	5′-11″	6′-0″
10	93	97	101	105	109	113	117	121	125				
11	94	98	102	106	110	114	118	122	126				
12	96	100	104	108	112	116	120	124	128				
13	98	102	106	110	114	118	122	125	129				
14	100	104	108	112	116	120	123	127	131				
15	103	106	109	113	117	121	125	129	133	137	141	145	149
16	105	108	111	114	118	122	126	130	134	138	142	146	150
17	107	110	113	116	119	123	127	131	135	139	143	147	151
18	109	112	115	118	121	124	128	132	136	140	144	148	152
19	111	114	117	120	123	126	130	134	138	142	146	149	153
20	113	116	119	122	125	128	132	136	140	144	147	150	154
21	114	117	120	123	126	129	133	137	141	145	148	151	155
22	115	117	120	123	126	129	133	137	141	145	149	152	156
23	116	118	121	124	127	130	134	138	142	146	150	153	157
24	117	119	121	124	127	130	134	138	142	146	150	154	158

Average Weight of Men
From M. A. M. I. Vol. I, p. 38

Age	5′	5′-1″	5′-2″	5′-3″	5′-4″	5′-5″	5′-6″	5′-7″	5′-8″	5′-9″	5′-10″	5′-11″	6′	6′-1″	6′-2″	6′-3″	6′-4″	6′-5″
15	107	109	112	115	118	122	126	130	134	138	142	147	152	157	162	167	172	177
16	109	111	114	117	120	124	128	132	136	140	144	149	154	159	164	169	174	179
17	111	113	116	119	122	126	130	134	138	142	146	151	156	161	166	171	176	181
18	113	115	118	121	124	128	132	136	140	144	148	153	158	163	168	173	178	183
19	115	117	120	123	126	130	134	138	142	146	150	155	160	165	170	175	180	185
20	117	119	122	125	128	132	136	140	144	148	152	156	161	166	171	176	181	186
21	118	120	123	126	130	134	138	141	145	149	153	157	162	167	172	177	182	187
22	119	121	124	127	131	135	139	142	146	150	154	158	163	168	173	178	183	188
23	120	122	125	128	132	136	140	143	147	151	155	159	164	169	175	180	185	190
24	121	123	126	129	133	137	141	144	148	152	156	160	165	171	177	182	187	192
25	122	124	126	129	133	137	141	145	149	153	157	162	167	173	179	184	189	194
26	123	125	127	130	134	138	142	146	150	154	158	163	168	174	180	186	191	196
27	124	126	128	131	134	138	142	146	150	154	158	163	169	175	181	187	192	197
28	125	127	129	132	135	139	143	147	151	155	159	164	170	176	182	188	193	198
29	126	128	130	133	136	140	144	148	152	156	160	165	171	177	183	189	194	199
30	126	128	130	133	136	140	144	148	152	156	161	166	172	178	184	190	196	201
31	127	129	131	134	137	141	145	149	153	157	162	167	173	179	185	191	197	202
32	127	129	131	134	137	141	145	149	154	158	163	168	174	180	186	192	198	203
33	127	129	131	134	137	141	145	149	154	159	164	169	175	181	187	193	199	204
34	128	130	132	135	138	142	146	150	155	160	165	170	176	182	188	194	200	206
35	128	130	132	135	138	142	146	150	155	160	165	170	176	182	189	195	201	207
36	129	131	133	136	139	143	147	151	156	161	166	171	177	183	190	196	202	208
37	129	131	133	136	140	144	148	152	157	162	167	172	178	184	191	197	203	209
38	130	132	134	137	140	144	148	152	157	162	167	173	179	185	192	198	204	210
39	130	132	134	137	140	144	148	152	157	162	167	173	179	185	192	199	205	211
40	131	133	135	138	141	145	149	153	158	163	168	174	180	186	193	200	206	212
41	131	133	135	138	141	145	149	153	158	163	168	174	180	186	193	200	207	213
42	132	134	136	139	142	146	150	154	159	164	169	175	181	187	194	201	208	214
43	132	134	136	139	142	146	150	154	159	164	169	175	181	187	194	201	208	214
44	133	135	137	140	143	147	151	155	160	165	170	176	182	188	195	202	209	215
45	135	135	137	140	143	147	151	155	160	165	170	176	182	188	195	202	209	215
46	134	136	138	141	144	148	152	156	161	166	171	177	183	189	196	203	210	216
47	134	136	138	141	144	148	152	156	161	166	171	177	183	190	197	204	211	217
48	134	136	138	141	144	148	152	156	161	166	171	177	183	190	197	204	211	217
49	134	136	138	141	144	148	152	156	161	166	171	177	183	190	197	204	211	217
50	134	136	138	141	144	148	152	156	161	166	171	177	183	190	197	204	211	217
51	135	137	139	142	145	149	153	157	162	167	172	178	184	191	198	205	212	218
52	135	137	139	142	145	149	153	157	162	167	172	178	184	191	198	205	212	218
53	135	137	139	142	145	149	153	157	162	167	172	178	184	191	198	205	212	218
54	135	137	139	142	145	149	153	158	163	168	173	178	184	191	198	205	212	219
55 & up	135	137	139	142	145	149	153	158	163	168	173	178	184	191	198	205	212	219

Average Weight of Women
From M. A. M. I. Vol. I, p. 67

Age	4′-8″	4′-9″	4′-10″	4′-11″	5′	5′-1″	5′-2″	5′-3″	5′-4″	5′-5″	5′-6″	5′-7″	5′-8″	5′-9″	5′-10″	5′-11″	6′
15	101	103	105	106	107	109	112	115	118	122	126	130	134	138	142	147	152
16	102	104	106	108	109	111	114	117	120	124	128	132	136	139	143	148	153
17	103	105	107	109	111	113	116	119	122	125	129	133	137	140	144	149	154
18	104	106	108	110	112	114	117	120	123	126	130	134	138	141	145	150	155
19	105	107	109	111	113	115	118	121	124	127	131	135	139	142	146	151	155
20	106	108	110	112	114	116	119	122	125	128	132	136	140	143	147	151	156
21	107	109	111	113	115	117	120	123	126	129	133	137	141	144	148	152	156
22	107	109	111	113	115	117	120	123	126	129	133	137	141	145	149	153	157
23	108	110	112	114	116	118	121	124	127	130	134	138	142	146	150	153	157
24	109	111	113	115	117	119	121	124	127	130	134	138	142	146	150	154	158
25	109	111	113	115	117	119	121	124	128	131	135	139	143	147	151	154	158
26	110	112	114	116	118	120	122	125	128	131	135	139	143	147	151	155	159
27	110	112	114	116	118	120	122	125	129	132	136	140	144	148	152	155	159
28	111	113	115	117	119	121	123	126	130	133	137	141	145	149	153	156	160
29	111	113	115	117	119	121	123	126	130	133	137	141	145	149	153	156	160
30	112	114	116	118	120	122	124	127	131	134	138	142	146	150	154	157	161
31	113	115	117	119	121	123	125	128	132	135	139	143	147	151	154	157	161
32	113	115	117	119	121	123	125	128	132	136	140	144	148	152	155	158	162
33	114	116	118	120	122	124	126	129	133	137	141	145	149	153	156	159	162
34	115	117	119	121	123	125	127	130	134	138	142	146	150	154	157	160	163
35	115	117	119	121	123	125	127	130	134	138	142	146	150	154	157	160	163
36	116	118	120	122	124	126	128	131	135	139	143	147	151	155	158	161	164
37	116	118	120	122	124	126	129	132	136	140	144	148	152	156	159	162	165
38	117	119	121	123	125	127	130	133	137	141	145	149	153	157	160	163	166
39	118	120	122	124	126	128	131	134	138	142	146	150	154	158	161	164	167
40	119	121	123	125	127	129	132	135	138	142	146	150	154	158	161	164	167
41	120	122	124	126	128	130	133	136	139	143	147	151	155	159	162	165	168
42	120	122	124	126	128	130	133	136	139	143	147	151	155	159	162	166	169
43	121	123	125	127	129	131	134	137	140	144	148	152	156	160	163	167	170
44	122	124	126	128	130	132	135	138	141	145	149	153	157	161	164	168	171
45	122	124	126	128	130	132	135	138	141	145	149	153	157	161	164	168	171
46	123	125	127	129	131	133	136	139	142	146	150	154	158	162	165	169	172
47	123	125	127	129	131	133	136	139	142	146	151	155	159	163	166	170	173
48	124	126	128	130	132	134	137	140	143	147	152	156	160	164	167	171	174
49	124	126	128	130	132	134	137	140	143	147	152	156	161	165	168	172	175
50	125	127	129	131	133	135	138	141	144	148	152	156	161	165	169	173	176
51	125	127	129	131	133	135	138	141	144	148	152	157	162	166	170	174	177
52	125	127	129	131	133	135	138	141	144	148	152	157	162	166	170	174	177
53	125	127	129	131	133	135	138	141	144	148	152	157	162	166	170	174	177
54	125	127	129	131	133	135	138	141	144	148	153	158	163	167	171	174	177
55	125	127	129	131	133	135	138	151	144	148	153	158	163	167	171	174	177

APPENDIX

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THE ACTUARIAL SOCIETY OF AMERICA
AND
ASSOCIATION OF LIFE INSURANCE MEDICAL DIRECTORS

JOINT COMMITTEE ON MORTALITY

December 26, 1928.

MEDICAL IMPAIRMENT STUDY (1929)

Dear Sir:

Your joint committee is now completing an investigation into occupational mortality. Unfortunately, comparatively few companies found themselves in a position to submit their material in the few months between the issue of the instructions and the date the summary sheets were to be in the hands of the Committee. Notwithstanding the fact that only twelve companies submitted their data, the material covered two-thirds of the total amount available. One of the reasons for the inability of a number of companies to contribute their material was that in many cases it was necessary to refer to the applications for more definite information regarding the occupation.

The Committee have been instructed by the Actuarial Society of America and by the Association of Life Insurance Medical Directors to prepare plans for a new investigation into the effect on mortality of medical impairments. It is the earnest desire of the Committee that as many companies as possible take part in this investigation, and accordingly the instructions are being issued in advance of the time the work should be commenced, thereby allowing a period for planning.

The Medico-Actuarial Mortality Investigation covered the issues of 1885 to 1908 inclusive, the data being carried to the anniversaries of the policies in 1909. It now seems desirable to take the material for the nineteen years of issue 1909 to 1927 inclusive, carried to the anniversaries in 1928. The companies are faced with the difficulty that a new medical code was put into effect in 1925 and that the mortality cards have to be re-perforated according to the new code for issues of 1924 and prior. In a number of impairments a better differentiation had been made under the new code and a complete change in the case of heart murmurs; accordingly under these impairments there would be experience available for three years of issue only and this would be insufficient for our purpose. To make an entirely satisfactory study it seems advisable to re-code a number of impairments according to the modern classifications. This will involve considerable work to many of the companies as it will be necessary to refer to the applications for additional information. After a good deal of deliberation the Committee have come to the conclusion that this additional work is justified, and that it would not be to the interest of the companies to follow the old classifications with the principal object of saving the companies time and expense.

We are now enclosing the following:

1. Instructions for preparing the cards or summary sheets.
2. List of impairments to be investigated.
3. Copy of mortality summary sheet.

It will be noted from a study of the list of impairments that the Committee have largely confined it to those which were marked "R" (Required) in the medical impairment code issued in 1924. At that time the Committee denoted the cases with the letter "R" which in their judgment would be investigated at a later time. A few such impairments have been omitted and several others have been added.

The members of the Joint Committee intend to ask their Companies to undertake an investigation into the mortality among policies for large amounts which will involve furnishing cards with the names under all policies for $50,000 or more on one life. These Companies will also be asked to give material, if possible, for an investigation into the mortality in the Southern States, into cases with a record of a medical impairment which was apparently transitory and into applicants with two or more deaths in the family from apoplexy or paralysis, insanity, and diabetes (codes No. 701, 702 and 703). Material from other Companies would be welcomed.

The Committee hope that your work can be started by the first of February so that the material may be in the hands of the Committee by the first of August. The members of the Committee have observed that in previous investigations the companies which were greatly delayed in furnishing their material or were unable to contribute their data consisted of those who had attempted to use their permanent force in preparing the material for collective investigations. We recommend each company to determine how many additional clerks will be necessary to complete the work in say five months, leaving a margin of a month for any unforeseen difficulties. It has been found feasible in several companies to use some of the temporary clerks in the regular mortality work of the company and to draft some of the experienced clerks to assist in preparing the material for the joint investigation.

In the M. A. M. I. there were few companies which had perforating machines in use. Accordingly that Committee agreed to receive policy sheets and to prepare perforated cards. As the majority of companies now have facilities for preparing their perforated cards, and as it would not be feasible to undertake the preparation of cards by a Central Bureau without a great deal of delay, the Committee hope that the companies will submit their material on summary sheets for each class to be investigated, unless there are less than 50 entrants, in which case perforated cards are desired.

The same plan will be followed with regard to the expenses as in the preceding investigations conducted during the last few years—namely, that each contributing company will meet the expense of preparing its perforated cards or summary sheets, and that the expense of collecting the material, analyzing the results, and publishing the findings of the Committee will be divided in proportion to their assets among all companies represented in the Actuarial Society of America or in the Association of Life Insurance Medical Directors.

Kindly notify the Chairman of the Committee at your earliest convenience whether or not you will take part in this investigation.

Yours very truly,

Medical Directors	*Actuaries*
Frank L. Grosvenor	John K. Gore
William Muhlberg	Robert Henderson
Oscar H. Rogers	William A. Hutcheson
H. Crawford Scadding	Henry Moir
Harry Toulmin	E. E. Rhodes
T. H. Willard	Arthur B. Wood
J. A. Patton (ex-officio)	J. D. Craig (ex-officio)

Arthur Hunter, *Chairman*

INSTRUCTIONS TO CONTRIBUTING COMPANIES

MEDICAL IMPAIRMENT CLASSES

This investigation covers the medical impairments shown on the attached list as well as tables of height and weight and study of mortality by build. Explanatory notes are attached to the list.

MATERIAL REQUIRED

The investigation of medical impairments deals with policies issued in the years 1909 to 1927 inclusive carried to the anniversaries in 1928. It will be unnecessary to climinate "duplicate" policies or to record amount of insurance. Only those cases are to be included which would have been granted life insurance at the normal rate of premium if it had not been for the impairment. This permits the inclusion of minor impairments. Only ordinary business is called for; thus industrial and group lines of insurance and $500 intermediate policies are omitted.

METHODS OF RECORDING DATA

The data are to be furnished on uniform mortality summary sheets, a sample of which is attached; but for any class with a given time code in which the company has less than 50 entrants the uniform perforated cards described in the Committee's booklet "Medical Impairment Code and Description of Mortality Cards—1924"* are to be transmitted instead. Exception is made under certain specified classes where cards are to be furnished regardless of the size of the groups. It is only necessary that the card show policy number, age, year of issue, impairments, duration, mode of exit and cause of death, and in some classes build and sex, systolic blood pressure or residence; thus it does not matter what use may have been made of other fields. In each class (unless otherwise noted) the "substandard" data are to be separated from those issued "standard" and a mortality summary sheet made for each. Attention is drawn to the fact that true (not rated) age is recorded on "substandard" cards.

DESIGNATION OF CLASSES

Throughout all the present investigations, when mortality sheets are used, the method of designating the material will be obvious. When perforated cards are supplied, however, certain special designations are required.

(a) In all cases "substandard" cards are to be distinguished by punching "X" in the first column of the age at issue field (Col. 12).

(b) All cards supplied for the study of mortality by build, (which includes those used to investigate standards of height and weight) are to have "Y" perforated in the first column of the height field (Col. 27).

(c) In the medical impairment classes when several code numbers appear in one class (not as combinations) the first only is to be perforated; thus (101, 102, 103, 105 B with G—J) is punched (101 B) and 502, 504 B—D) is punched (502 B). As regards the time code exception to this rule is required in a few cases; for example, under heart murmurs, (301 XG) requires a double punch to distinguish it from (301 X), likewise, 872 (X—F) G is punched 872XG.

(d) Build when specified on the medical impairment list may be cared for by perforating the build group in the build field. In such a class as (141), which appears twice on the list, subdivided

*Copies were sent to each company at the time. Additional copies may be obtained through the Actuarial Society.

first by time code and second by build—it is expected that only one card will be furnished for each case, if cards are furnished.

(e) Finally there are certain other subdivisions of the impairment classes which may be most simply designated by the "X" and "Y" in the first and second columns of the impairment field. These are indicated under the respective impairments by (X1), (Y1), (X2), (Y2), in this order. Thus the last of the eight subdivisions under impairment (303)—see list—is punched $\left\{\begin{matrix} Y \\ 303\ X \\ G \end{matrix}\right\}$, while a case of impairment (302) without hypertrophy is (302X) if the systolic blood pressure is not 15 or more Mm. above the average for the age-group but is $\left\{\begin{matrix} X \\ 302X \end{matrix}\right\}$ if 15 or more Mm. above average.

CAUSE OF DEATH

The principal causes of death are to be recorded on the summary sheet in two groups of ages at issue; the classification used is that of the M. A. M. I. Where perforated cards are furnished, the cause of death should be given.

BASIC TABLE OF MORTALITY

As a means for measuring the expected deaths a basic table will be prepared. The ten largest contributing companies will be requested to furnish a mortality summary sheet of exposed and deaths under standard business issued in 1909-1927 carried to 1928. This should be by amounts insured since some companies do not have the material by policies. It is desirable that the preparation of this standard table be advanced as much as possible in order that printed sheets may be prepared with the resulting rates of mortality indicated at the respective age-groups and durations. The subdivisions according to cause of death may be made by examining a representative proportion of the records of death in those companies where it would be a prohibitive amount of labor to examine them all.

TABLES OF HEIGHT AND WEIGHT AND MORTALITY BY BUILD

Independent of the studies of medical impairment mortality, the Committee wish to prepare new tables of height and weight for men and for women and to investigate the mortality according to build. The data will exclude any cases made "substandard" for medical impairment or occupation, and are to come from the issues of all years from 1885 to 1927 exposed during the years 1909 to 1928. This arrangement is made in order to have a greater proportion of business at the longer durations of exposure. Where the companies cannot, without an excessive amount of labor, obtain the material for the build study on issues prior to 1909, the Committee will be contented with the issues for the years 1909 to 1927, inclusive. The companies are requested to furnish 2% of the "standard" cases, preferably one week in January of the odd years and one week in July of the even years, and all cases treated "substandard" for build alone. At ages under 20, however, all the "standard" data are to be given which each company can conveniently furnish. For the tables of height and weight only the issues of 1909 to 1927 will be used by the Committee. These cards will show height and weight in the column designated for that purpose on the uniform standard card or in the corresponding impairment field on the substandard card. Sex appears in column (8). The build group need not be perforated on the cards. The Committee's present plan is to report build groups according to height and weight, leaving each company free to make the necessary deductions therefrom to fit their own method of handling build. It is hoped that build groups can be based on the proposed new tables of height and weight.

IMPAIRMENT LIST

NOTES ON THE LIST OF IMPAIRMENTS

1. The impairment code in the following list is that shown in the booklet of the Joint Committee—"Medical Impairment Code and Description of Mortality Cards" (1924). It should be observed that the time code "S" (Suspected, questionable, doubtful) is not included in any of the investigations and likewise "L" (attack at indefinite time in past) is omitted throughout. The designation of the classes is referred to in the instructions to contributing companies.

2. The references under residence are to the code used in the M. A. M. I. (Vol. 1, p. 124).

3. Build is requested under a number of classes and a uniform code is needed for use in this investigation. In the Joint Committee's report on blood pressure (1925) the majority of entrants had build recorded by the code shown on page 13, i.e., according to percentage departure from the average weight for age and sex. This method is accordingly now recommended for the present purpose.

4. Any policy made "substandard" for build, residence, blood pressure, etc., should be excluded, except where these are specified. Where two or more numbers are combined, the group is intended to include cases having one or other impairment. Where combinations are desired to include more than one impairment on one life they appear under the head of "combinations" at the end of the list, but build and residence appear in the body of the list as a matter of convenience.

5. Where the time-code recorded on the list states "each with (G—J)" the intention is to ask for the given time code whether with or without any of these special symbols, which in such cases represent degree and not two or more attacks. Thus in making up the class 873B there may be certain cases where size of goitre has been specified (as 873BG) and these are to be included as well as those simply coded 873B. Any company which has applied the symbols of multiple significance to other classes than those which have been designated by the Joint Committee may increase the volume of its contribution by similar procedure.

6. Systolic blood pressure groups are indicated under certain impairments in accordance with the method employed on page 31 of the Committee's blood pressure report (1925).

7. The dash is used to mean all inclusive while the comma separates one class from another. Thus "B—F" means B and C and D and F all in the same class, while "B, C" designates each of two classes.

LIST OF MEDICAL IMPAIRMENTS

Code No.	*Time Code*
101, 102, 103, 105	B, C, D, F each with (G—J)
104	B, C, D, F each with (G—J)
111	B—C, D—F, G—H, J—K

Under each of these time classes of (111) the companies are requested to make two subdivisions (X1) operation recorded for removal of tonsils prior to application for insurance, (Y1) all others.

Code No.	*Time Code*
141	C, D, F
141	C—F Build (a) 20% or more underweight, (b) others
142	C—F Build (a) 20% or more underweight, (b) others
152	C, D, F
152	C—F Build 30% or more overweight
153	C—D
154	C—D
158	B—D

There are to be three subgroups of (158) according to the area affected—(X1) larynx, (Y1) bladder, (X2) not specified or others.

Code No.	*Time Code*
181	X with (G—H) Build (a) 10% or more underweight, (b) 9% under to 9% overweight, (c) 10% or more overweight
200	B—F Encephalitis lethargica only is to be taken.
204, 205	X—B, C—D, G—J
222	B—F
253, 254, 257	X—B, C—F, G—K
263	B—F
301	X, XG
302	X, XG, XH

302X is to be divided into two groups according to the occupation of the insured whether involving light or heavy work—(X1) clerical, managerial, professional service, light work such as is generally done in retail stores, and in dressmaking establishments, (Y1) carpenters, painters, bricklayers and other artisans, farmers, lumbermen, steelworkers, laborers and similar heavy work. All these will of course have been rated "standard" for insurance as regards occupation.

303X with history of rheumatism with tonsillectomy recorded (X1)
303X with history of rheumatism without tonsillectomy recorded (Y1)
303X with other infection with tonsillectomy recorded (X2)
303X with other infection without tonsillectomy recorded (Y2)
303X with G—H, with history of rheumatism with tonsillectomy recorded (X1)
303X with G—H, with history of rheumatism without tonsillectomy recorded (Y1)
303X with G—H, with other infection with tonsillectomy recorded (X2)
303X with G—H, with other infection without tonsillectomy recorded (Y2)

Code No.	*Time Code*
304	X, XG
305, 306	X, XG, XH
307, 308	X, XG
309	X
310	X, X with (G—H)
314, 315	X, XG
316	X
326	XG, XH
330	X
331	X
332	X
333	X
334	X
335	X
336	X
337	X
338	X
339	X
344	X

Only "substandard" data are to be furnished under (344). The following three classes of systolic blood pressure are called for:

Ages	*Over Average (X1)*	*High (Y1)*	*Highest (X2)*
15-29	125-135 Mm.	136-144 Mm.	145+ Mm.
30-44	130-140 Mm.	141-149 Mm.	150+ Mm.
45-53	135-145 Mm.	146-154 Mm.	155+ Mm.
54-70	140-150 Mm.	151-159 Mm.	160+ Mm.

These are based on the groups which appeared in the Committee's 1925 report on blood pressure (p. 47); it is hoped now to have a considerably larger volume of material. The companies are reminded that not all the cases coming under these headings may have been coded (344); it may also be necessary to examine the systolic blood pressure field.

Code No.	*Time Code*	
401	C, D, F	
402	C, D, F	
403	C, D—F	
401, 402, 403	C—F	Build (a) 10% or more underweight, (b) 9% under to 9% overweight, (c) 10% or more overweight
411	X	Build (a) 10% or more underweight, (b) 9% under to 9% overweight, (c) 10% or more overweight
411	X	Residence (X1) eight mountain states (03, 07, 15, 32, 34, 37, 51, 57); (Y1) sea coast and gulf counties, (00, 04, 11, 13, 21, 28, 29, 49); (X2) elsewhere
413, 414	X—C, G—H	
416	B—F	Build (a) 10% or more underweight, (b) 9% under to 9% overweight, (c) 10% or more overweight
418	X—F	Build (a) 10% or more underweight, (b) 9% under to 9% overweight, (c) 10% or more overweight
425	B—C, D	

Each of the sections of (425) is to be divided according to duration of the attack—(X1) less than 2 weeks, (Y1) 2 weeks or more. Those not specified as to duration of attack are to be omitted.

Code No.	*Time Code*
426	B—D
427	B—C, D
428	B—C, D
502, 504	B—D, G—J

Only "substandard" data are to be furnished under (502, 504).

Code No.	*Time Code*	
506	C, D, G—J	
507	C, D, G—J	
520, 521, 526	B, C, D, G—J	
522, 524	B, C, D	
523, 525	B—D	
536	X—D	
537	B—D	
536, 537	X—D	Build (a) 20% or more underweight, (b) 19% under to 19% overweight, (c) 20% or more overweight

Code No.	*Time Code*
546	B, C, D, G—J
547	B, C, D, G—J
603	X
604	X
605	X
607	X
608	X
609	X

Under albumin (601-609) the standards to be used are those adopted by the Association of Life Insurance Medical Directors (Proceedings XI, p. 245).

Code No.	*Time Code*
601-9	X Build 30% and more overweight
601-9	B
611, 612, 613, 614	X
620	X, B
623	X, B
624	X, B
626	X, B
627	X

Under glycosuria (620-627) the definitions of intermittent and constant are to be the same as under albumin (see "definitions" in the 1925 code).

Code No.	*Time Code*
643	B—C, D, G—J
644	B—C, D, G—J
645	B—J
646	B, C, D, F
656, 657	X—F
667	B—C, D
669	B, C, D
711	X * Height and weight to be recorded
712	X * Height and weight to be recorded
713	X * Height and weight to be recorded
720	X—B * Height and weight to be recorded

*Under (711), (712) and (713) a living parent, brother or sister sick with tuberculosis should be treated the same as a death would be. Under these three classes and (720) cards are to be furnished regardless of the size of the data; height and weight will appear in the first impairment field of "substandard" cards here, and sex in column (8).

Code No.	*Time Code*
801	X—B, G—K †
802	X—B, G—K †
804	X—B, G—K †
806	X—B, G—K †
807	X—B, G—K †

† Under these classes there are to be two groups of years of issue—(a) 1909-1918 and (b) 1919-1927, excluding Canadian policyholders from the latter.

Code No.	*Time Code*
811	X—F
821	X
822	X
834	X
835	X
841	X Build (a) 10% or more underweight, (b) 9% under to 9% overweight.
860	X Build (a) 0-29% overweight, (b) 30-39%, (c) 40% and more overweight.
861	X Build (a) 0-29% overweight, (b) 30-39%, (c) 40% and more overweight.
871	B, C, D—F each with G—J
872	X—F, (X—F)G, (X—F)H
873	B, C, D—F each with G—J
885	X—B, C—F

COMBINATIONS

302X with Systolic blood pressue 15 or more Mm. above average for age.*
302X with G—H with Systolic blood pressure 15 or more Mm. above average for age.*
314, 315X with Systolic blood pressure 15 or more Mm. above average for age.*
314, 315X with G—H with Systolic blood pressure 15 or more Mm. above average for age.*

*The following table is to be used here:

Ages	+ *15 and more* (*X2*)
15-29	135+ Mm.
30-44	140+ Mm.
45-53	145+ Mm.
54-70	150+ Mm.

601—609X with 610—616 X with G—J.
603X with Systolic blood pressue 10 Mm. or more under average, 9 under to 9 over, 10 and more over average.†
607X with Systolic blood pressure 10 Mm. or more under average, 9 under to 9 over, 10 and more over average.†
841X with Systolic blood pressure 10 Mm. or more under average, 9 under to 9 over, 10 and more over average.†

†The table used for this purpose follows:

Ages	*Under* (*X1*)	*Average* (*Y1*)	*Over* (*X2*)
15-29	−110 Mm.	111-129 Mm.	130+ Mm.
30-44	−115 Mm.	116-134 Mm.	135+ Mm.
45-53	−120 Mm.	121-139 Mm.	140+ Mm.
54-70	−125 Mm.	126-144 Mm.	145+ Mm.

Code No.

834X with 835X

SUPPLEMENTARY MEMORANDUM

LARGE AMOUNTS

In addition to the impairments on the main list, a few companies,—of which yours is one,—are requested to furnish material under policies of large amounts. A card of the uniform type is to be given for each policy of $50,000 or more issued at one time. This is to include, if possible, policies issued on the same application for smaller amounts but aggregating $50,000 or more. There is to be only one card for the total amount issued on one application, and reinsurances of the policies of other companies are to be omitted. The first name, other initials and surname and date of birth of the insured are to be given in order that the Committee may bring together all the insurance on one life. This material will be held in strictest confidence and carefully guarded. This investigation is confined to the issues of 1919 to 1927, carried to the anniversaries in 1928. These cards are designated by "Y" in column (9).

SOUTHERN STATES

If you have mortality data in any of the Southern States which can be readily put in shape for publication and wish to forward it to the Committee on mortality summary sheets, they would be glad to consider its publication with the other material. The M. A. M. I. residence code is to be used.

IMPAIRMENTS FORMERLY REPORTED NOT NOW PRESENT

If you can conveniently supply data on cases of medical impairments which have been "q"-ed, you are requested to send the Committee a card under each case of blood pressure, heart murmur, albuminuria and glycosuria which comes in this category. These cards may be identified by using "S" in the impairment field to represent "Q". In doing this the companies will of course exclude all cases made "substandard" for any other impairment including build.

FAMILY HISTORY (701, 702, 703)

Finally, if without undue labor you can supply material under impairment classes (701X), (702X), or (703X) separately it would be greatly appreciated by the Committee.

1909-1927 BASIC TABLE—UNIT $1,000

Ages at Entry 15-19

Insurance Year	Exposed to Risk	Actual Deaths	Expected Deaths by 1909-1927 Table
1	1,943,818	4,253	3,950
2	1,510,557	3,870	3,952
3	1,243,479	3,263	3,390
4	1,024,129	2,952	2,907
5	817,222	2,352	2,435
6	653,009	2,226	2,033
7	535,123	1,747	1,678
8	434,555	1,385	1,358
9	328,496	1,001	1,017
10	237,301	764	731
11	183,238	461	562
12	140,067	452	430
13	106,929	365	330
14	82,356	233	255
15	61,653	162	192
16	41,437	138	131
17	26,385	82	86
18	14,020	40	47
19	6,255	28	22
Total	9,390,029	25,774	25,506

Ages at Entry 20-24

Insurance Year	Exposed to Risk	Actual Deaths	Expected Deaths by 1909-1927 Table
1	4,286,859	8,804	9,061
2	3,221,742	9,015	9,072
3	2,655,675	8,368	7,930
4	2,204,078	6,898	6,800
5	1,830,134	5,677	5,804
6	1,510,011	4,819	4,911
7	1,267,310	4,091	4,078
8	1,061,839	3,268	3,389
9	841,403	2,721	2,671
10	653,423	2,104	2,079
11	560,404	1,723	1,802
12	445,702	1,336	1,469
13	346,370	1,259	1,176
14	266,179	876	932
15	200,519	663	734
16	138,524	499	530
17	88,286	442	354
18	48,058	209	203
19	21,125	68	94
Total	21,647,641	62,840	63,089

Ages at Entry 25-29

Insurance Year	Exposed to Risk	Actual Deaths	Expected Deaths by 1909-1927 Table
1	5,900,535	12,399	12,606
2	4,519,286	12,295	12,862
3	3,759,670	11,721	11,436
4	3,120,586	9,724	9,790
5	2,596,679	8,699	8,460
6	2,146,749	7,392	7,299
7	1,800,524	5,860	6,162
8	1,503,466	5,171	5,214
9	1,189,001	4,307	4,203
10	911,065	3,378	3,327
11	755,286	2,642	2,865
12	606,790	2,427	2,415
13	476,331	1,881	2,006
14	369,224	1,743	1,657
15	282,494	1,212	1,354
16	197,594	1,121	1,019
17	128,394	724	709
18	72,019	396	429
19	32,348	256	208
Total	30,368,041	93,348	94,021

Ages at Entry 30-34

Insurance Year	Exposed to Risk	Actual Deaths	Expected Deaths by 1909-1927 Table
1	6,837,400	15,554	15,328
2	5,345,665	15,293	15,969
3	4,449,201	13,765	14,102
4	3,653,186	11,852	12,063
5	3,010,288	11,117	10,670
6	2,462,578	9,627	9,564
7	2,053,737	7,899	8,268
8	1,714,734	7,386	7,227
9	1,343,062	6,339	5,955
10	1,007,166	4,440	4,714
11	794,932	3,711	3,988
12	636,834	3,385	3,452
13	499,148	3,047	2,949
14	389,613	2,560	2,500
15	302,041	1,995	2,099
16	214,243	1,656	1,619
17	142,262	1,197	1,167
18	82,633	564	739
19	36,549	399	358
Total	34,975,272	121,786	122,731

1909-1927 BASIC TABLE—UNIT $1,000—Continued

Ages at Entry 35-39

Insurance Year	Exposed to Risk	Actual Deaths	Expected Deaths by 1909-1927 Table
1	6,706,173	17,975	18,165
2	5,292,149	20,068	19,709
3	4,404,371	18,253	17,555
4	3,586,919	15,324	14,944
5	2,930,246	12,963	13,116
6	2,368,910	11,269	11,795
7	1,966,410	10,166	10,354
8	1,623,372	9,577	9,207
9	1,265,812	7,906	7,793
10	948,738	6,223	6,385
11	737,880	5,568	5,483
12	593,538	5,036	4,863
13	468,037	4,373	4,208
14	366,319	3,623	3,590
15	285,019	3,108	3,040
16	203,998	2,453	2,377
17	136,442	1,654	1,740
18	79,372	1,255	1,116
19	34,953	537	541
Total	33,998,658	157,331	155,981

Ages at Entry 40-44

Insurance Year	Exposed to Risk	Actual Deaths	Expected Deaths by 1909-1927 Table
1	5,337,775	16,724	16,576
2	4,252,306	17,629	18,923
3	3,538,467	18,502	17,895
4	2,871,091	16,734	16,058
5	2,328,242	14,456	14,671
6	1,871,343	14,038	13,553
7	1,548,480	11,620	11,970
8	1,281,769	10,667	10,680
9	1,008,575	9,740	9,118
10	768,858	7,026	7,566
11	593,043	6,395	6,455
12	477,532	5,475	5,773
13	376,356	5,492	5,067
14	294,734	4,148	4,371
15	228,460	3,998	3,728
16	163,092	2,927	2,915
17	109,340	1,998	2,147
18	64,332	1,388	1,396
19	27,485	724	662
Total	27,141,280	169,681	169,524

Ages at Entry 45-49

Insurance Year	Exposed to Risk	Aetual Deaths	Expected Deaths by 1909-1927 Table
1	3,527,879	16,600	16,077
2	2,842,437	17,984	18,239
3	2,384,019	17,054	17,225
4	1,927,705	15,365	15,331
5	1,555,461	14,076	14,054
6	1,231,405	13,622	12,838
7	1,006,587	10,743	11,212
8	829,986	9,605	10,014
9	658,352	8,890	8,749
10	506,248	6,872	7,522
11	386,986	6,763	6,506
12	310,750	6,067	5,876
13	245,537	5,357	5,154
14	191,746	4,610	4,419
15	149,366	3,630	3,755
16	106,763	2,652	2,946
17	70,086	2,598	2,147
18	40,682	1,574	1,378
19	17,121	671	639
Total	17,989,116	164,733	164,081

Ages at Entry 50-54

Insurance Year	Exposed to Risk	Actual Deaths	Expected Deaths by 1909-1927 Table
1	2,013,228	12,945	13,096
2	1,615,352	15,221	15,011
3	1,336,750	14,986	14,266
4	1,060,040	12,017	12,432
5	836,366	11,115	11,077
6	650,272	9,515	9,914
7	527,669	8,209	8,705
8	432,045	8,067	7,849
9	345,714	7,176	6,971
10	269,384	6,036	6,060
11	208,876	4,882	5,270
12	168,132	4,885	4,778
13	130,562	4,446	4,151
14	101,109	3,326	3,553
15	78,309	3,539	3,017
16	53,525	2,134	2,235
17	35,556	1,377	1,610
18	20,257	1,031	1,000
19	8,506	354	458
Total	9,891,652	131,261	131,453

Ages at Entry 55-59

Insurance Year	Exposed to Risk	Actual Deaths	Expected Deaths by 1909-1927 Table
1	883,891	9,132	8,839
2	698,909	9,709	9,951
3	569,966	10,720	9,426
4	447,619	8,171	8,146
5	348,356	6,390	7,114
6	267,867	6,345	6,272
7	213,430	5,558	5,355
8	175,217	4,732	4,740
9	140,497	3,331	4,147
10	111,171	3,768	3,658
11	82,562	2,987	3,051
12	64,191	2,775	2,659
13	48,928	2,260	2,253
14	37,953	1,735	1,928
15	29,063	1,386	1,625
16	21,283	1,324	1,309
17	14,293	651	964
18	8,446	512	628
19	3,363	327	276
Total	4,167,005	81,813	82,341

Ages at Entry 60-64

Insurance Year	Exposed to Risk	Actual Deaths	Expected Deaths by 1909-1927 Table
1	261,496	3,342	3,425
2	201,397	3,733	3,817
3	161,929	4,077	3,656
4	119,402	3,214	3,050
5	88,346	2,361	2,588
6	64,930	2,235	2,208
7	50,388	1,642	1,859
8	40,202	1,920	1,620
9	31,715	1,578	1,391
10	24,317	1,029	1,162
11	18,078	868	953
12	14,177	866	840
13	10,710	566	721
14	8,213	672	632
15	6,130	447	536
16	4,225	413	415
17	2,657	307	288
18	1,444	167	169
19	409	30	52
Total	1,110,165	29,467	29,382

Ages at Entry 65 & Over

Insurance Year	Exposed to Risk	Actual Deaths	Expected Deaths by 1909-1927 Table
1	50,033	1,144	997
2	38,409	950	1,072
3	29,605	1,102	968
4	21,167	673	782
5	14,298	551	611
6	10,595	500	531
7	8,428	502	462
8	6,768	402	405
9	5,483	348	359
10	4,145	244	298
11	3,137	339	251
12	2,193	212	199
13	1,465	114	153
14	1,065	154	131
15	658	184	94
16	306	26	49
17	203	34	37
18	78	7	15
19	30	9	6
Total	198,066	7,495	7,420

All Ages

Insurance Year	Exposed to Risk	Actual Deaths	Expected Deaths by 1909-1927 Table
1	37,749,087	118,872	118,120
2	29,538,209	125,767	128,577
3	24,533,132	121,811	117,849
4	20,035,922	102,924	102,303
5	16,355,638	89,757	90,600
6	13,237,669	81,588	80,918
7	10,978,086	68,037	70,103
8	9,103,953	62,180	61,703
9	7,158,110	53,337	52,374
10	5,441,816	41,884	43,502
11	4,324,422	36,339	37,186
12	3,459,906	32,916	32,754
13	2,710,373	29,160	28,168
14	2,108,511	23,680	23,968
15	1,623,712	20,324	20,174
16	1,144,990	15,343	15,545
17	753,904	11,064	11,249
18	431,341	7,143	7,120
19	188,144	3,403	3,316
Total	190,876,925	1,045,529	1,045,529

1909-1927 BASIC TABLE—UNIT $1,000—SYNOPSIS

Ages at Entry 15-29

Insurance Year	Exposed to Risk	Actual Deaths	Expected Deaths by 1909-1927 Table	Ratio %
1-2	21,382,797	50,636	51,503	98.3
3-5	19,251,652	59,654	58,952	101.2
6-10	15,073,275	50,234	50,150	100.2
11-19	5,697,987	21,438	22,011	97.4
Total	61,405,711	181,962	182,616	99.6

Ages at Entry 30-39

Insurance Year	Exposed to Risk	Actual Deaths	Expected Deaths by 1909-1927 Table	Ratio %
1-2	24,181,387	68,890	69,171	99.6
3-5	22,034,211	83,274	82,450	101.0
6-10	16,754,519	80,832	81,262	99.5
11-19	6,003,813	46,121	45,829	100.6
Total	68,973,930	279,117	278,712	100.1

Ages at Entry 40-49

Insurance Year	Exposed to Risk	Actual Deaths	Expected Deaths by 1909-1927 Table	Ratio %
1-2	15,960,397	68,937	69,815	98.7
3-5	14,604,985	96,187	95,234	101.0
6-10	10,711,603	102,823	103,222	99.6
11-19	3,853,411	66,467	65,334	101.7
Total	45,130,396	334,414	333,605	100.2

Ages at Entry 50-59

Insurance Year	Exposed to Risk	Actual Deaths	Expected Deaths by 1909-1927 Table	Ratio %
1-2	5,211,380	47,007	46,897	100.2
3-5	4,599,097	63,399	62,461	101.5
6-10	3,133,266	62,737	63,671	98.6
11-19	1,114,914	39,931	40,765	98.0
Total	14,058,657	213,074	213,794	99.7

Ages at Entry 60 & Over

Insurance Year	Exposed to Risk	Actual Deaths	Expected Deaths by 1909-1927 Table	Ratio %
1-2	551,335	9,169	9,311	98.5
3-5	434,747	11,978	11,655	102.8
6-10	246,971	10,400	10,295	101.0
11-19	75,178	5,415	5,541	97.9
Total	1,308,231	36,962	36,802	100.4

All Ages

Insurance Year	Exposed to Risk	Actual Deaths	Expected Deaths by 1909-1927 Table	Ratio %
1-2	67,287,296	244,639	246,697	99.2
3-5	60,924,692	314,492	310,752	101.2
6-10	45,919,634	307,026	308,600	99.5
11-19	16,745,303	179,372	179,480	99.9
Total	190,876,925	1,045,529	1,045,529	100.0

MEDICAL IMPAIRMENT STUDY

1929

(SAMPLE MORTALITY SUMMARY SHEET)

CODE NO._____ ISSUES OF 1909 TO 1927 INCLUSIVE.

POLICY YEAR	AGES 15 TO 19						AGES 20 TO 24						AGES 25 TO 29					
	Existing	Lapsed	Dead	Exposed	Basic Rate	Expected Deaths	Existing	Lapsed	Dead	Exposed	Basic Rate	Expected Deaths	Existing	Lapsed	Dead	Exposed	Basic Rate	Expected Deaths
1					2.03						2.11						2.14	
2					2.62						2.82						2.85	
3					2.73						2.99						3.04	
4					2.84						3.09						3.14	
5					2.98						3.17						3.26	
6					3.11						3.25						3.40	
7					3.14						3.22						3.42	
8					3.12						3.19						3.47	
9					3.10						3.17						3.53	
10					3.08						3.18						3.65	
11					3.07						3.21						3.79	
12					3.07						3.29						3.98	
13					3.09						3.39						4.21	
14					3.09						3.50						4.49	
15					3.11						3.66						4.79	
16					3.17						3.83						5.16	
17					3.25						4.02						5.52	
18					3.36						4.22						5.96	
19					3.51						4.45						6.43	

	AGES 45 TO 49						AGES 50 TO 54						AGES 55 TO 59					
	Existing	Lapsed	Dead	Exposed	Basic Rate	Expected Deaths	Existing	Lapsed	Dead	Exposed	Basic Rate	Expected Deaths	Existing	Lapsed	Dead	Exposed	Basic Rate	Expected Deaths
1					4.56						6.50						10.00	
2					6.42						9.29						14.24	
3					7.23						10.67						16.54	
4					7.95						11.73						18.20	
5					9.04						13.24						20.42	
6					10.43						15.25						23.42	
7					11.14						16.50						25.09	
8					12.07						18.17						27.05	
9					13.29						20.17						29.51	
10					14.86						22.49						32.91	
11					16.81						25.23						36.96	
12					18.91						28.42						41.43	
13					20.99						31.80						46.04	
14					23.05						35.14						50.79	
15					25.14						38.53						55.90	
16					27.60						41.76						61.50	
17					30.64						45.26						67.45	
18					33.87						49.37						74.32	
19					37.29						53.83						82.08	

SYNOPSIS

BY POLICY YEAR

Years	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
1- 2				
3- 5				
6-10				
11-19				
ALL				

BY AGE AT ISSUE

Ages	(1) Exposed to Risk	(2) Actual Dead	(3) Expected Dead	Ratio % (2) ÷ (3)
15-29				
30-39				
40-49				
50 and over				
ALL				

M. A. Code	CAUSE
(82-91) part	Accident, not war..
(82-91) part	Warfare .....
01	Typhoid .....
05	Influenza .....
17	Tuberculosis of lung

MENT STUDY (1929)

STUDIED TO ANNIVERSARY IN 1928 BY POLICIES: Co. No._____

Ages 30 to 34						Ages 35 to 39						Ages 40 to 44					
Existing	Lapsed	Dead	Exposed	Basic Rate	Expected Deaths	Existing	Lapsed	Dead	Exposed	Basic Rate	Expected Deaths	Existing	Lapsed	Dead	Exposed	Basic Rate	Expected Deaths
				2.24						2.71						3.11	
				2.99						3.72						4.45	
				3.17						3.99						5.06	
				3.30						4.17						5.59	
				3.54						4.48						6.30	
				3.88						4.98						7.24	
				4.03						5.27						7.73	
				4.21						5.67						8.33	
				4.43						6.16						9.04	
				4.68						6.73						9.84	
				5.02						7.43						10.89	
				5.42						8.19						12.09	
				5.91						8.99						13.46	
				6.41						9.80						14.83	
				6.95						10.67						16.32	
				7.56						11.65						17.87	
				8.20						12.76						19.63	
				8.95						14.06						21.70	
				9.80						15.47						24.10	

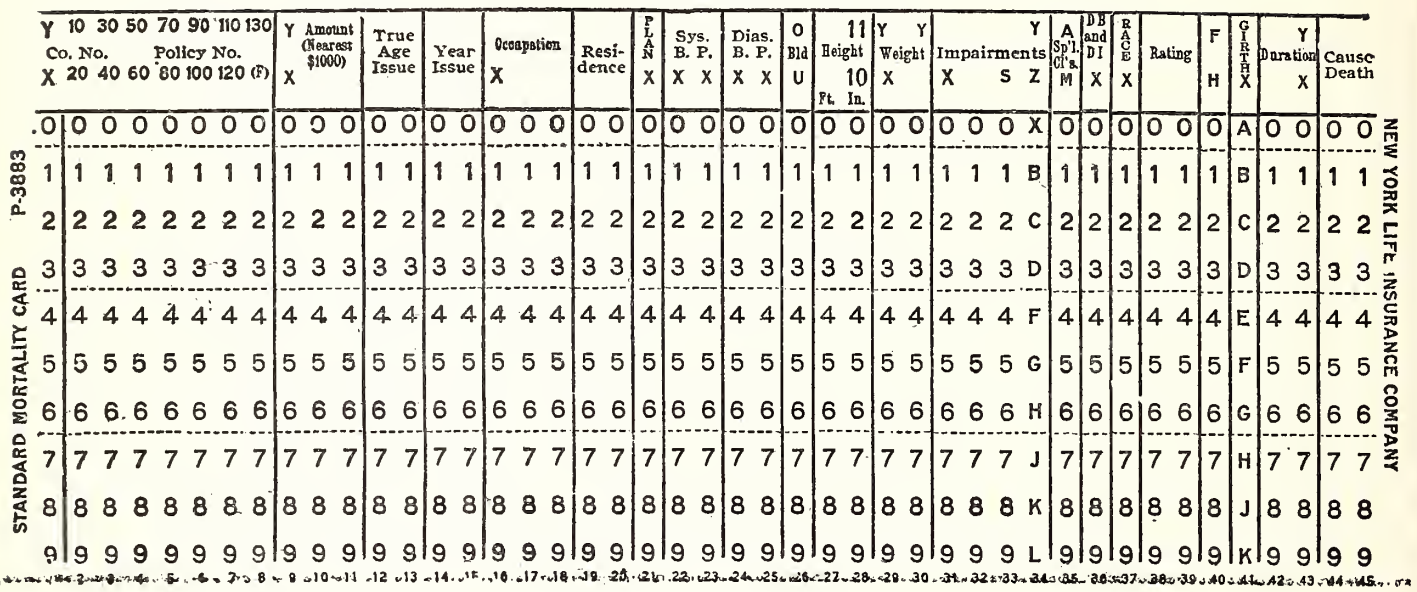
Ages 60 to 64						Ages 65 and Over						All Ages					
Existing	Lapsed	Dead	Exposed	Basic Rate	Expected Deaths	Existing	Lapsed	Dead	Exposed	Basic Rate	Expected Deaths	Existing	Lapsed	Dead	Exposed	Basic Rate	Expected Deaths
				13.10						19.93							
				18.95						27.92							
				22.58						32.71							
				25.55						36.93							
				29.30						42.77							
				34.01						50.10							
				36.89						54.77							
				40.29						59.88							
				43.87						65.48							
				47.79						71.96							
				52.75						80.07							
				59.22						90.64							
				67.31						104.66							
				76.98						122.45							
				87.44						142.34							
				98.10						161.59							
				108.13						178.67							
				117.55						193.92							
				127.01						208.80							

NUMBER OF DEATHS BY CAUSE

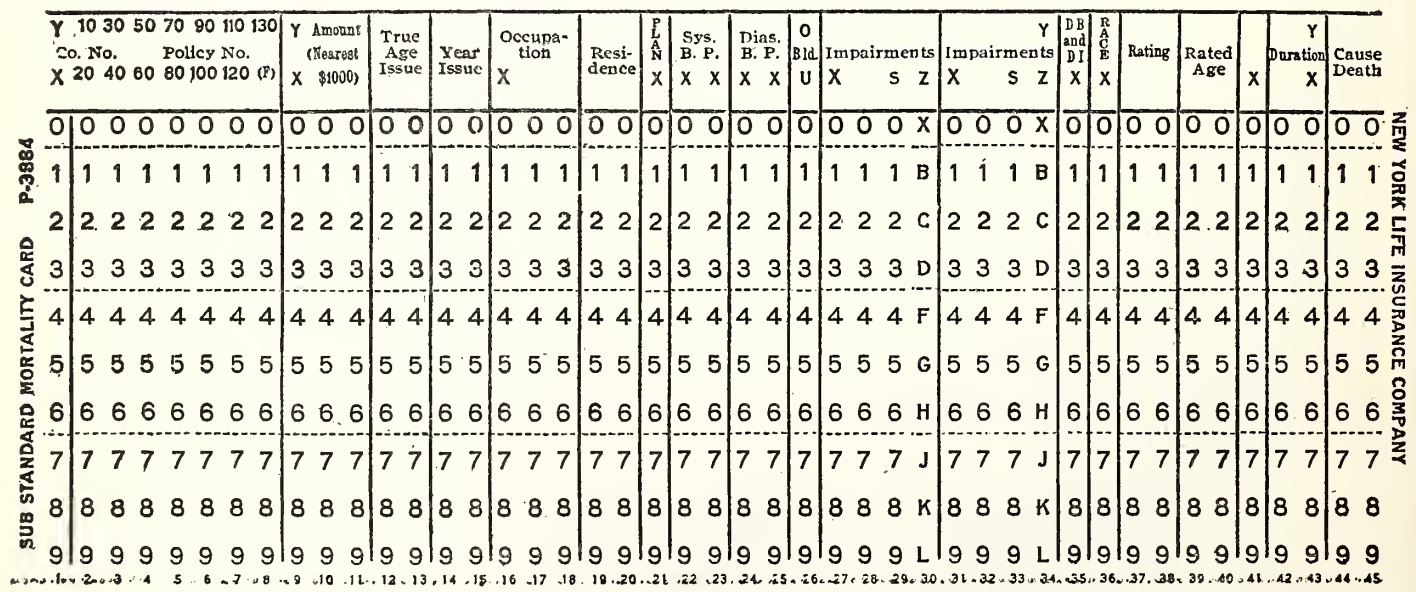
Issue Ages 15-39	Issue Ages 40 and over	M. A. Code	CAUSE	Issue Ages 15-39	Issue Ages 40 and over	M. A. Code	CAUSE	Issue Ages 15-39	Issue Ages 40 and over
		18	Other Tuberculosis.....			60	Appendicitis and Typhlitis...		
		21	Cancer and other mal. Tumors			63	Cirrhosis of Liver.....		
		24	Diabetes			68	Nephritis and Bright's disease		
		33	Cerebral Hemorrhage and Apoplexy			81	Suicide.....		
						—	All other causes.....		
		43	Organic disease of Heart....						
		51	Pneumonia.....			—	Total.....		

STANDARD AND SUBSTANDARD MORTALITY CARDS

CARD FOR STANDARD CASES



CARD FOR SUBSTANDARD CASES



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